TECHNOLOGY DEP

- TV in pulp and paper making
- Water soluble organic coatings
- Truck-trailer pulpwood handling
- Perkin's discovery and the paper industry

The Paper Industry

Publishers of PAPER AND PULP MILL CATALOGUE

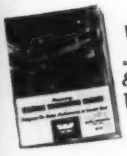
When this car was no. 1 this CRANE handled its first load!

*This was it in 1928 . . . the Ford Model "A"

Twenty-eight years of constant use . . . and still going strong! Keokuk Electro-Metals Co., Keokuk, Iowa, purchased their Whiting Overhead Traveling Crane back in 1928, and it's been working every shift since. Just recently, Keokuk decided to install a new trolley assembly, the first major replacement on their crane in all these years.

Other Whiting Cranes, engineered-to-the-job, are at work right now in the pulp and paper industry, establishing similar records of trouble-free operation. Cost-conscious mills depend on them for steady, efficient handling of paper, from machines to storage and storage to cars. Get more for your money — long life, low maintenance — with a Whiting Crane! Ask for complete information now on the type of crane you require. *WHITING CORPORATION, 15653 Lathrop Avenue, Harvey, Illinois*

MANUFACTURERS OF TRAMBEAM HANDLING SYSTEMS • TRACKMOBILE FOUNDRY, RAILROAD AND CHEMICAL PROCESSING EQUIPMENT



WRITE TODAY . . .
. . . for Whiting Crane Bulletin No. 80, containing the 14 outstanding Whiting Crane features.

WHITING

● Early 18th Century Chinese Plate with Yang-Yin symbol in the center. From the collection of Captain and Mrs. H. F. L. Davis, now owned by Mrs. H. N. Hill.

● This symbol (Yang-Yin) represents T'ai-chi, the old Chinese *Ultimate Principle*, and as such, *perfection*. As the Asten-Hill trademark it symbolizes the *best* in paper mill DRYER FELTS.

ASTEN-HILL MFG. CO.
Philadelphia 29, Pa.
Walterboro, S.C.
Salem, Ore.

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Valleyfield, Quebec

FISHER

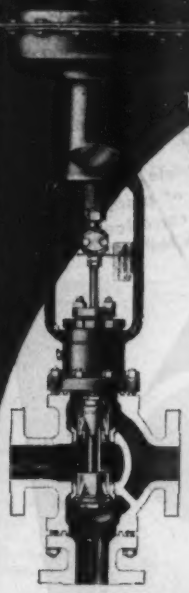
THREE-WAY DMVS

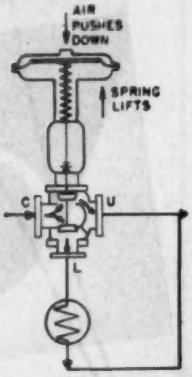
FOR

BY-PASS, MIXING or BLENDING SERVICE

TYPE 657-YY

Three-way control valve for by-pass or proportioning service. Available all castable alloys sizes ½ thru 12".

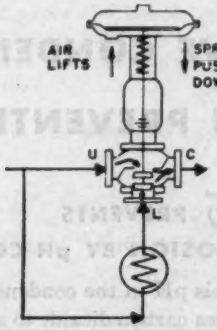




By-pass flow is from "C" to "U" with no air on diaphragm. Flow through heat exchanger from "C" to "L" with air on diaphragm.

TYPE 667-Y

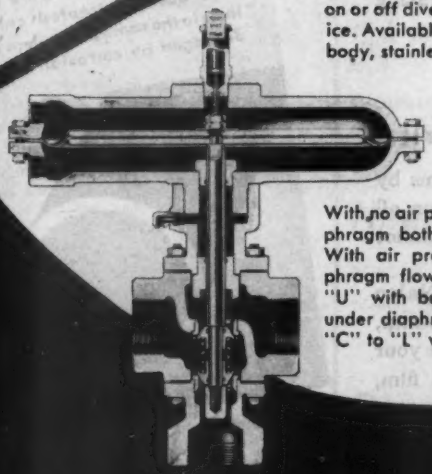
Three-way control valve single disc type for by-pass or mixing applications. Available all castable alloys sizes ½ thru 12".

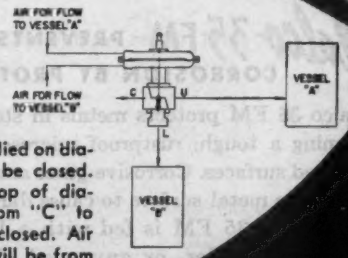


Normal flow is from "U" to "C" with air off diaphragm. With air under diaphragm flow is through exchanger from "L" to "C".

TYPE 1620

Three-way, three-position valve for on or off diversion and shut-off service. Available with 2" screwed steel body, stainless steel trim.





With no air pressure applied on diaphragm both ports will be closed. With air pressure on top of diaphragm flow will be from "C" to "U" with bottom port closed. Air under diaphragm flow will be from "C" to "L" with upper port closed.

FISHER

Since 1880

In the next 4 years...

Will your condensate return lines

Look like this . . .
Section of condensate line, removed after four years of plant service, shows excellent corrosion protection obtained with Nalco 35.

. . . Or like this?
In the four years before Nalco 35 was used, untreated condensate lines in the same plant were seriously damaged by corrosion and pitting.

TWO *Nalco* METHODS FOR POSITIVE CONDENSATE CORROSION PREVENTION

1 *Nalco* 35 PREVENTS CORROSION BY pH CONTROL

Nalco 35 controls pH in the condensate return system... neutralizes carbon dioxide to assure corrosion prevention. Especially recommended for low make-up systems, Nalco 35 vaporizes and condenses with the steam, *and at the same rate.* Uniform treatment concentration is assured throughout the system; and long-lasting Nalco 35 makes positive return-line, tank, and valve protection a real operating economy.

2 *Nalco* 35 FM PREVENTS CORROSION BY PROTECTIVE FILM

Nalco 35 FM protects metals in steam systems by forming a tough, rustproof microscopic film on all exposed surfaces. Corrosive gases and liquids cannot reach the metal surface to cause damage.

Nalco 35 FM is fed with a low-cost Nalco condenser-feeder, or any good chemical pump, directly into steam or condensate lines. Once your steam system has protection of Nalco 35 FM film, low dosages maintain film permanently.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place • Chicago 38, Illinois
In Canada: Alchem Limited, Burlington, Ontario

THE *Nalco*®

SYSTEM . . . Serving Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

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The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

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HAM PELTZ says:

You can get a paper maker's cap like mine FREE for your son, daughter, or grandchild just by writing me on your company's letterhead at the address below. The cap is adjustable—fits any head size and carries a SAFETY SLOGAN. Supply limited. No obligation. Write me today.

You can't beat HAMILTON Felts . . .

for INCREASING MILL EFFICIENCY from the wet end of your machines to the drier rolls

With wages at an all time high manufacturers of paper and board are faced with the task of making the only kind of savings now possible—*operational* savings.

Hamilton Felts help make this possible. *Want to prove it?*

Adjust the bearings of your least efficient machine. Regrind the rolls, if necessary, for perfect alignment; Install a Hamilton Felt—then speed up!

As the web passes through the press Hamilton Felts will remove so much water that little steam will be needed . . . Stronger sheets will be formed Free from soft spots and felt marks. Down-time for adjustments will be reduced. Broke will be insignificant.

Hamilton FELTS

Whatever you manufacture—from heaviest board to thinnest tissue—we will be happy to supply a Hamilton Felt of standard construction from more than 300 proven styles . . . or design a variation to solve your specific problem.

MIAMI WOOLEN MILLS
Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

From our point of view . .

The value of closer contact between related industries

THE RECENT VISIT by sixty representatives of Dow Chemical Co. to the paper mills in the Kalamazoo area (see page 592) reflects a high degree of foresight and planning which could be adopted profitably by many other industrial establishments. The importance Dow Chemical placed on this visit is reflected in the diversity of its research talent visiting the paper mills. The Dow group represented twelve of the company's research laboratories.

The paper industry has a multitude of problems, the solution of which would spell a tremendously increased productivity for this industry. Many of these problems — especially those of product quality, new products and new applications — will find their ultimate solution in a chemical laboratory where new chemicals can be developed that will impart certain specific and highly desirable properties to paper products.

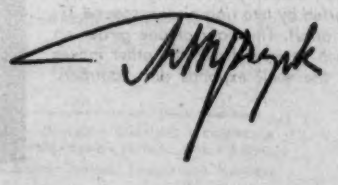
Other problems are those connected with improved pulp and papermaking processes. These may involve new chemicals as well as new or improved equipment designs. The latter will challenge the ingenuity of the engineering staffs of supplier industries, whose products range from heavy papermaking equipment to steam turbines, electric motors, pumps, pipes, valves, ventilation, instrumentation, etc.

In every case, however, the chemist or engineer has a better chance of solving the problems of the pulp and paper industry if he is intimately familiar with them. He will gain such familiarity by seeing the industry in operation and discussing the problems with the technical staffs of the industry. Looking at a problem from the outside invariably leads to a more objective approach and opens new angles of attack.

It is only during such contacts between the research and engineering staffs of the papermaking and supplier industries that a problem can be clearly defined and evaluated in all its aspects. If its solution is not immediately apparent, the discussion will often point out a plausible approach to it.

A closer contact between industries supplementing each other in many ways can be mutually beneficial. If the chemical industry were in position to supply the paper industry with chemicals that incorporate the desired properties, the paper industry would become an even better customer than it is today. Currently, as is well known, the paper industry is the fourth largest consumer of chemicals.

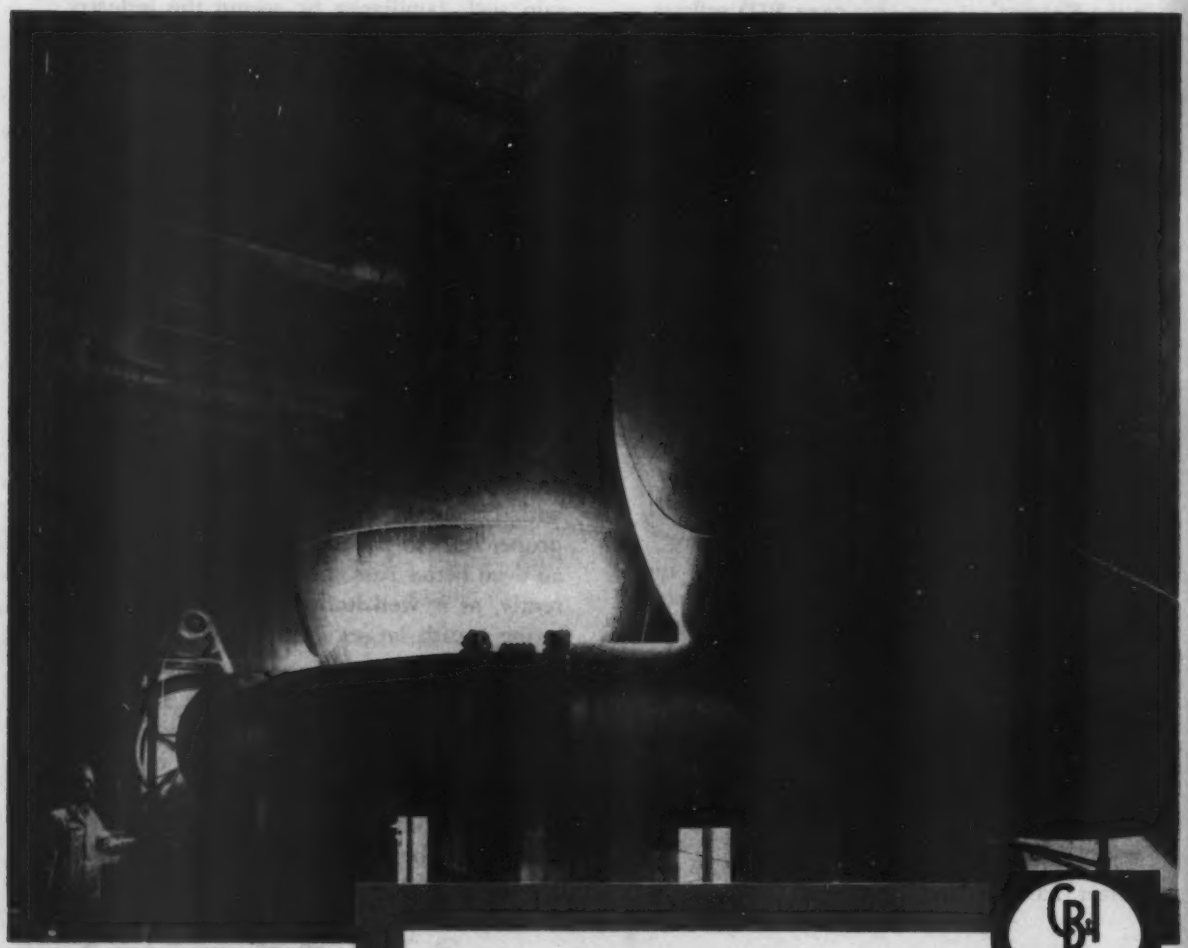
A closer contact between various branches of the American industry will also have another important, even if less tangible, effect. It will bring about a greater unity and identity of purpose which, under the threat of present conflicting idealogies, have a value that cannot be appraised in terms of material wealth.



Builds Dump Chests Used In Sulphite Recovery Process

At the Weyerhaeuser Timber Company's plant at Longview, Washington, these four welded steel dump chests were installed as part of a sulphite recovery process. The structures, fabricated by Chicago Bridge & Iron Company, receive pulp which is washed from the digesters by sulphite waste liquors. The chests are protected on the inside by acid-resistant linings.

These structures illustrate the skilled workmanship CB&I employs in fabricating and erecting spherical structures.



16-ft. diam. by 71-ft. long chests supported by two ring girders spaced 37-ft. apart. The base of one girder on each vessel is fixed, the other moves as the shell expands and contracts.

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • Tulsa

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

SIZING PROBLEMS?

Cyanamid can help you cut them down to size

It would be hard to find a sizing problem that our Technical Service Staff has not met at one time or another. Out of this experience we have developed a great number of size grades—*more than any other supplier*. That's why we can meet a mill's sizing requirements exactly. With this most complete line, plus our research and application laboratories to back it up, most problems can be quickly cut down to size. Take these problems:

DUSTING? You can use CYFOR® Rosin Size dry and reduce or even eliminate dusting problems.

FOAM? ACCOBRITE® Size offers a *zero* foam index. Or you may find the solution in low-foaming CYFOR Size or non-foaming dark sizes.

BRIGHTNESS? Tops for brightness and color stability are X and WW grades of ACCOBRITE Size.

HIGHER SIZING SPECS? Meet them with CYFOR Size and cut costs or meet requirements unattainable with other sizes.

HANDLING COSTS? You can save handling, storage and charging costs by filling your bulk needs with Cyanamid *liquid* size grades.

ACID/ALKALI RESISTANCE? CYRON® Size is an especially effective beater additive that needs no alum, rosin or wax.

We could go on and on. Perhaps your best bet, though, is to talk over sizing problems with your Cyanamid Technical Service man. He'll help you cut *any* problem involving paper chemicals down to size.

CYANAMID

AMERICAN CYANAMID COMPANY
Paper Chemicals Department
30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: Boston • Charlotte • Chicago • Cleveland • Kalamazoo
Los Angeles • Mobile • New York • Philadelphia • Portland, Ore. • Seattle
In Canada: North American Cyanamid Limited, Toronto and Montreal

Discussion on "Sales and Service to the Paper Industry" featured panel members Fletcher Thornton of Stowe-Woodward, Albany Sales Manager Jim Smith, Appleton Wire's Smith McLandress, and Albany Field Sales Manager Ray Dustrude.

Panel on "Suction Transfer Arrangements" was headed by Fred Moden of St. Croix Paper Company, Albany Chief Designer Stu Engle, Halifax Paper's M. L. Boinest, and Albany Director and Technical Field Service Larry Woodside.

Service is Keynote of 20th A

Albany Felt Company's entire group of Sales and Service Engineers and executives formed this "team" attending the sales meeting.

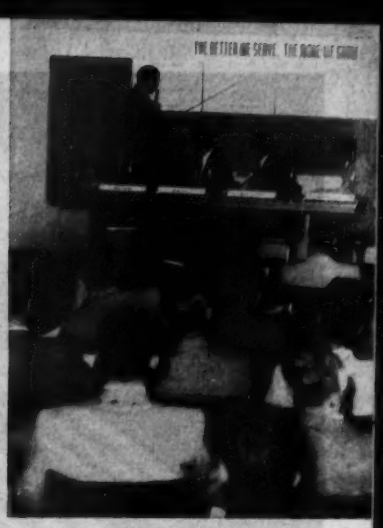
Third row, left to right: Charles W. Page, George R. Woolfe, Carl C. Hendricks, Edwin D. Lyon, Frank J. McGrath, Elliott R. Barker, Robe Gordon, John F. Howell, William C. Larkin, Edward C. Paca, Robert D. Gregory, Larry B. Lane.

Second row: Walter D. Willetts, Joseph E. Tanner, C. Robert Spellman, Bruce R. Owre, William H. Schaffner, Edgerton F. Hyde, George E Fitch, Clifford E. Van Buren, Lowell A. Brown, Larry H. Brown, Niels J. Larsen, Harry H. Stillwell.

First row: Laurence M. Woodside, Chief Engineer, Technical Field Service; Marcus T. Reynolds, Assistant Sales Manager; James E. Smith, Sale Manager; Lewis R. Parker, President; Wayne G. Davis, Vice President, Sales; Raymond P. Dustrude, Field Sales Manager.

...those attending actively participated in the ...tive technical "buzz sessions" which were con... with a variety of paper mill problems.

Lewis R. Parker, Albany Felt Company President, reported on progress and future plans, forecast continued healthy growth in paper industry.



Technical sessions invariably played to "standing room only" throughout the two day meeting at the main plant at Albany, N. Y.

Albany Felt Sales Meeting

Finding inspiration in the theme "The Better We Serve — The More We Grow," the 20th semi-annual Albany Felt Company sales meeting swept through two days of intensive technical sessions, lightened only by an occasional coffee break and the sports activities following its close. Held on Sept. 13 and 14, the meeting was presented as an integral part of the educational program which is maintained by the Company for its Sales and Service Engineers.

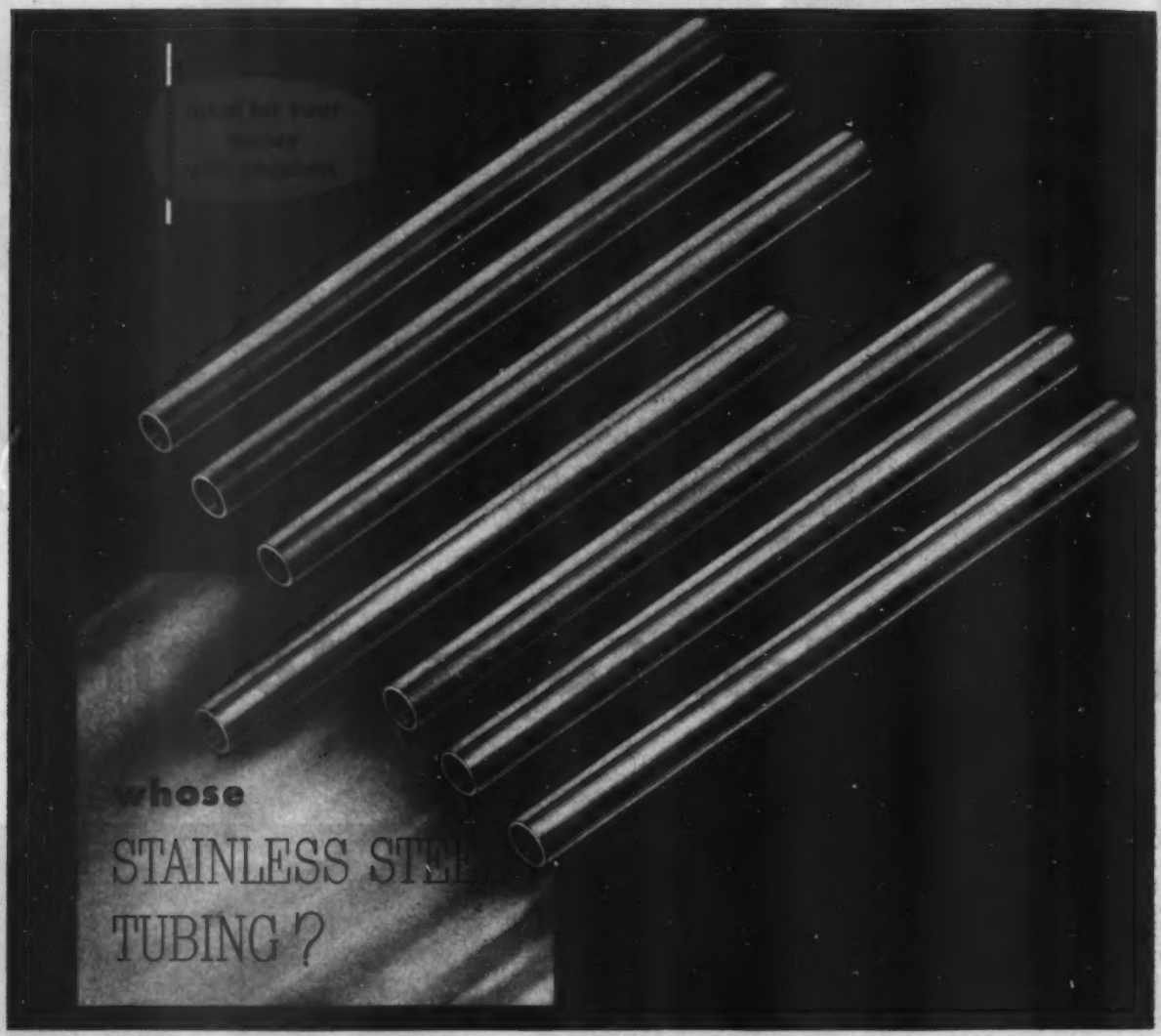
Highlights of the program were panel discussions which included guest authorities on two important subjects. First of these was the panel on "Sales and Service to the Paper Industry," with valuable contributions from guests Smith McLandress, Vice President of Appleton Wire Works, Inc., and Fletcher Thornton, Vice President of Howe-Woodward, Inc. The second featured a discussion of "Suction Transfer Arrangements," with M. L. Boinest, Superintendent of Halifax Paper Company, and Fred Moden, Assistant General Superintendent of St. Croix Paper Company, offering the results of their practical experience with this important phase of papermaking.

Premiere showing of the new Albany Felt color-sound slide film entitled "Felt Applications" also received enthusiastic reception, as did the progress reports from the Company's manufacturing, research and sales executives. Average attendance at these informative sessions averaged well over one hundred, made up of sales and service engineers from the United States and Canada, supplemented with staff personnel from all departments who took an active part in the meeting. Adjournment of the meeting was followed with an afternoon of sports activities and climaxed with a banquet presented to the sales organization by Lewis R. Parker, President.

Discussions of the subjects of the previous session continued even during the occasional "coffee breaks." Below: Reward and relaxation from the intensive meeting sessions was found on the links after the close of the two-day meeting.

ALBANY FELT COMPANY

MAIN OFFICE AND PLANT, ALBANY, N. Y. OTHER PLANTS: HOOSICK FALLS, N. Y., N. MONMOUTH, ME., ST. STEPHEN, S. C., COWANSVILLE, P. Q.



Choosing a stainless steel supplier is like choosing a friend; all else appearing equal, the intangibles of service and reputation stand out. Many users of stainless steel turn to B&W because they know B&W's reputation for quality and service, and because they know that B&W controls every step in the tube-making operation from pouring the stainless ingot to carefully inspecting the finished stainless tube. Because B&W quality control more than satisfies all customer and code requirements, every buyer of B&W stainless steel tubes is assured of manufacturing skill, uniformity and close tolerances in every foot of stainless tubing he acquires, and quick service via a nationwide network of B&W stainless tubing distributors.

Take a tip from the experience of thousands in the process industries, as well as architects, designers, fabricators and finishers, and get in touch with Mr. Tubes, your link to B&W, for a detailed story of the advantages of B&W stainless tubing and how you can get more for your money with stainless. *Or write for Bulletin TB 355.* The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA-6064(P)

Seamless and welded tubular products, seamless welding fittings and flanges—in carbon, alloy and stainless steels

GUARANTEE YOUR PAPER QUALITY WITH A VIKING VOID DETECTOR!

MEASURES • LOCATES • RECORDS • CONTROLS HOLES IN PAPER—CONTINUOUSLY
100% WEB INSPECTION FOR 100% OF PRODUCTION TIME
ELIMINATES REJECTION COSTS DUE TO IMPERFECTIONS

QUALITY CONTROL . . .

Viking Void Detector is a revolutionary aid to proper quality control. Easy to install and operate, it continuously inspects—unerringly—entire paper surface at any speed.

WIDE RANGE . . .

Standard Model Type VRD-2 tests paper up to .025" thick. It locates, counts holes of 1/64" in diameter and larger. Instruments for other ranges available.

HOLE SIZE SELECTOR . . .

A sensitivity adjustment permits selection of the exact size of holes to be located. Void Detector can be adjusted to differentiate between hole sizes—by-pass small holes, indicate only larger holes.

GREAT FLEXIBILITY . . .

The Feeler Brush is designed to permit rapid adjustment for variances in web widths without interruption of production run.

POSITIVE LOCATION . . .

The two and three position units not only indicate the holes and the sections of the web in which they appear, but count the holes.

PROOF OF PERFORMANCE

The Viking Void Detector has already been acclaimed by pulp and paper mills in many installations.

VIKING

VIKING VOID DETECTOR TYPE VRD-2
3 POSITION INDICATOR UNIT

Three standard indicator units: Single Position; Two Position; Three Position. Each equipped with switches to permit testing of each indicating position prior to or during operation. Counter units—electrically actuated, manually reset—record total number of holes in material passing through rollers.

Unit is engineered for easy operation and maintenance. Operates constantly under rugged industrial conditions. Connecting outlets for optional accessory equipment are furnished. Pilot light indicates when unit is on. Standard unit designed for impressed voltage of 110 V—60 cycle AC. Units for other voltages available.

THE ONLY INSTRUMENT OF ITS KIND AVAILABLE
WRITE FOR FULL DETAILS

INDICATOR UNIT RECORDS HOLES

Indicator Unit may be located adjacent to Feeler Brush, or at remote point. It records low voltage pulse transmitted by Feeler Brush. Several Indicator Units can be connected in parallel.

FEELER BRUSHES MAKE CONTACT

Feeler Brush, electrically connected to Indicator Unit, makes contact with one side of paper. It picks out paper void, transmits low voltage pulse to Indicator Unit.

AUDIBLE AND/OR VISUAL SIGNALS

Visual signal is incorporated in the Viking Void Detector and provisions are made for the connection of audible alarms and 24-hour recording equipment.

—VIKING LEADS IN—

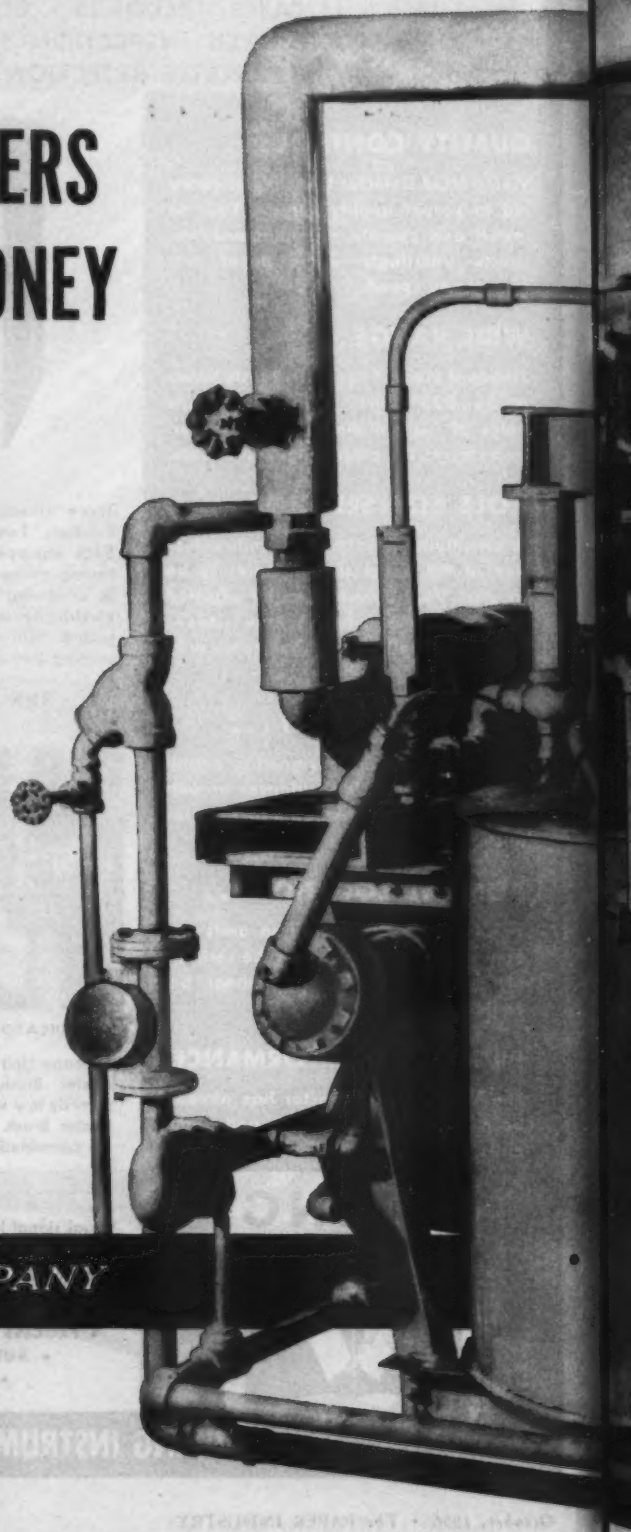
• PROCESS CONTROL INSTRUMENTATION • SPECIAL INDICATOR SYSTEMS
• AUTOMATIC PLANT EQUIPMENT • ALARM SYSTEMS
• SAFETY CONTROLS FOR ALL INDUSTRIAL APPLICATIONS

VIKING INSTRUMENTS INC. • EAST HADDAM, CONN., U.S.A.

*There must be reasons for leadership**

FOR EXAMPLE: HERCULES AUTOMATIC EMULSIFIERS HELP MILLS SAVE MONEY

Hercules has assisted in the industry's progress by designing mechanical improvements for mill operations. The development and extensive use of the Hercules Automatic Emulsifier is typical of these innovations. More than 125 of these units are now in use helping mills lower labor costs, reduce space requirements and obtain greater uniformity of emulsion concentration and quality of size emulsion. If you are interested in learning more about this equipment, one of our technical representatives will be glad to discuss it with you. Just write:



Paper Makers Chemical Department PP10-6

HERCULES POWDER COMPANY

961 *King Street,*
Wilmington 99, Delaware

**Hercules is the acknowledged leader in rosin size and other chemicals for papermaking.*

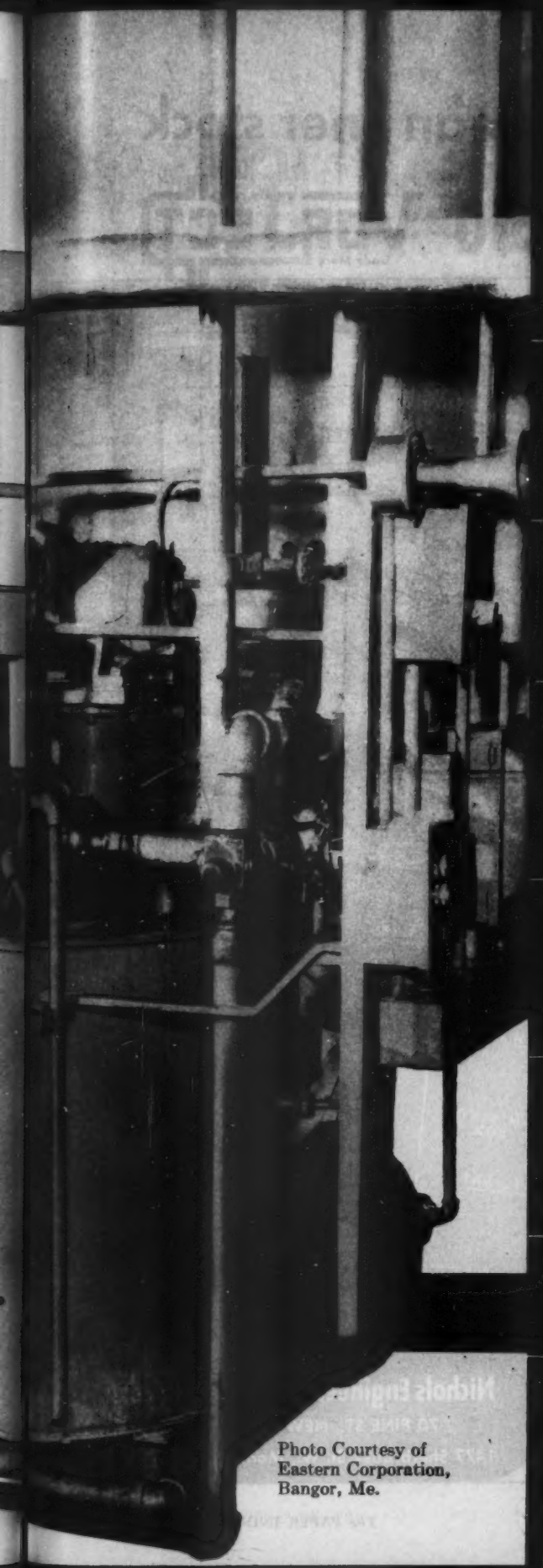


Photo Courtesy of
Eastern Corporation,
Bangor, Me.

SOME REASONS FOR HERCULES LEADERSHIP

UNEQUALED TECHNICAL SERVICE
A staff of more than 50 technically trained men are thoroughly grounded in the cumulative experience of 40 years' mill and laboratory service to the paper industry. Such company experience results in an understanding of the requirements of the paper industry and is reflected in the variety and dependable quality of the products designed to meet them. One of these men is always as near as your telephone.

FORWARD-LOOKING CHEMICALS
From Hercules research come new products designed to anticipate your needs for improved chemical materials. Whether it is a new grade of size based on rosin or a completely new concept, you can look to Hercules for progressive leadership.

UNMATCHED DISTRIBUTION FACILITIES
Hercules maintains by far the largest number of plants and strategically-located distribution points of any rosin size manufacturer. This is your assurance that the product you want will be delivered when and where you want it.

A SIZE FOR EVERY NEED
Hercules' large number of sizing grades means there is one available to meet practically any requirement. For unusual problems, Hercules can formulate a custom-made grade to fit your specific need. Hercules assures you the lowest possible sizing cost by recommending the right grade for your specific needs.

PACE-SETTING RESEARCH
The most extensive research and technical service facilities devoted exclusively to papermaking are maintained by Hercules. The Hercules laboratories are always at the disposal of customers in helping to solve sizing and other papermaking problems.

VARIETY OF PRODUCTS
Hercules is also a leading source of other high-quality papermaking chemicals. Wax emulsions, wet strength resins, defoamers—to name but a few made by Hercules—incorporate the same degree of skilled processing improvements that are found in Hercules'® rosin sizes.

DEPENDABLE SOURCE OF SUPPLY
Hercules' many facilities for producing rosin and rosin size assure you of a thoroughly dependable source of supply.

SAVINGS IN SHIPPING
Hercules has pioneered many improvements in rosin size distribution. The freight and handling savings made possible through the introduction of dry size and higher solids paste size, both in tank truck and tank car shipments, are typical examples.

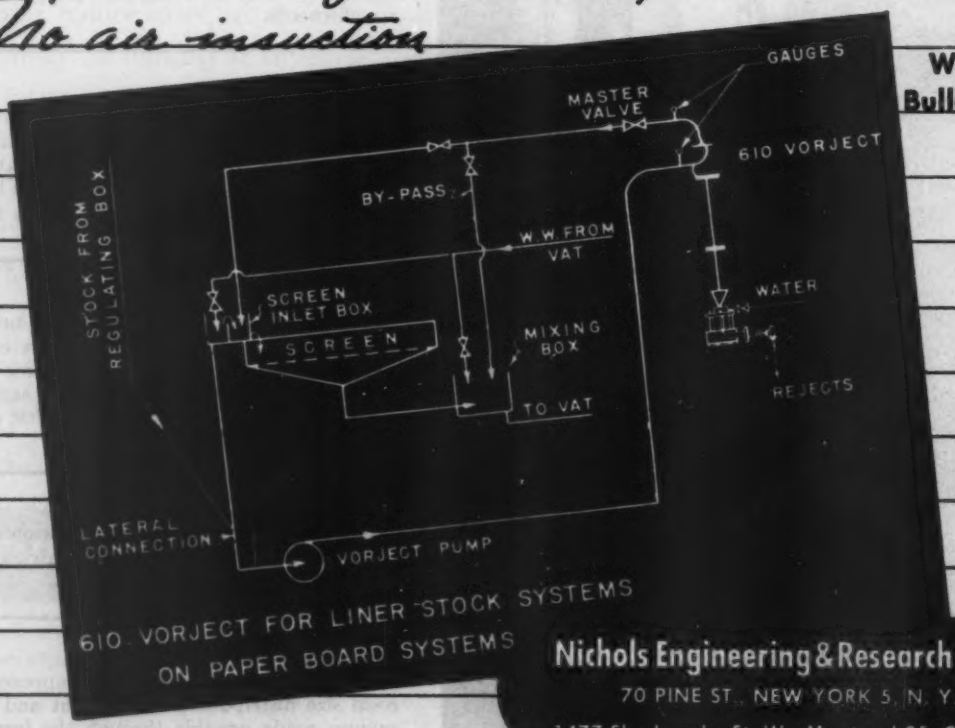
HERCULES POWDER COMPANY

Blueprint...for a clean liner stock

the Nichols Freeman 610 VORJECT® Cleaner

Trade Mark

1. High cleaning efficiency
2. Simple layout & operation-one unit for the average cylinder vat
3. Increased screen capacity
4. Low fibre loss (5lb./ton maximum)
5. Complete control of type of rejects
6. Stainless steel construction
7. Economies-stock upgraded-more production-fewer washups
8. No air insuction



610 VORJECT FOR LINER STOCK SYSTEMS
ON PAPER BOARD SYSTEMS

Write for Bulletin "M"

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It's packed with photos of mill operations...flow charts...44 pages full of practical ideas to help you reduce costs, speed operations.

You'll find ideas you can use on conveying, power transmission, elevating, water treatment, and many other items of interest to you.

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54-112

CHAIN BELT COMPANY

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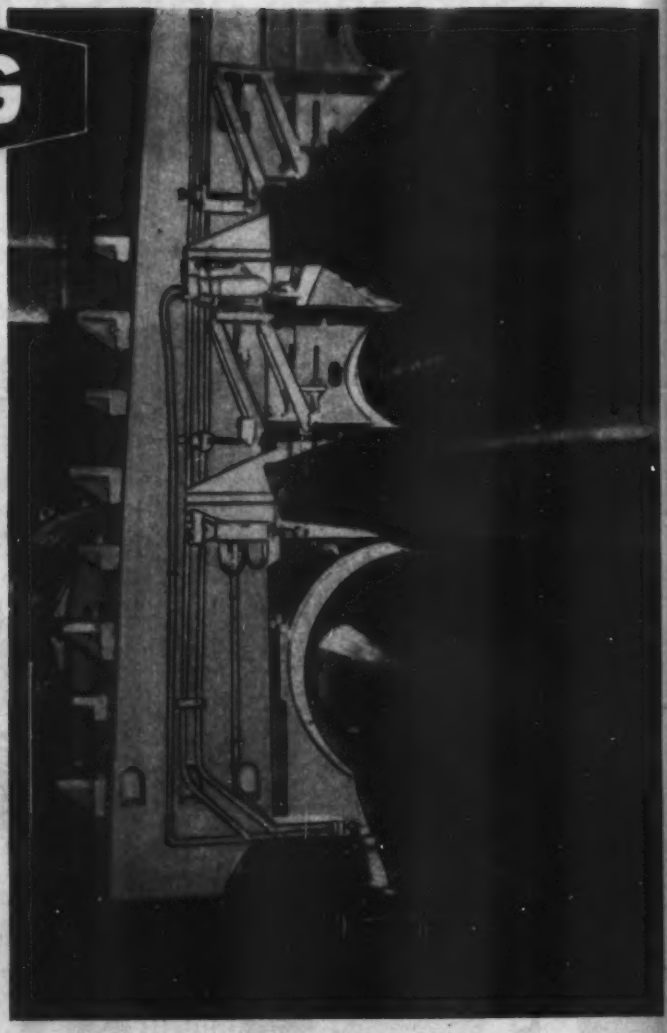
LODDING

Just what the doctor ordered....



Lodding special linkage design because of special frame on this calender . . . . doctors retractable for roll changes. Another example of the long-standing Lodding principle:

Recognizing service requirements.

Delivering *results.*

LODDING ENGINEERING CORPORATION

WORCESTER, MASSACHUSETTS

SIMPLIFIED CONTROL

for high-speed paper finishing . . .
with Westinghouse MAGAMP regulators

Westinghouse Magamp* magnetic amplifier regulators permit you to operate finishing machines at maximum speeds without sacrificing paper quality. Their demonstrated *high availability* assures you reduced down time, while providing precise control and coordination of required machine functions.

*Trade-Mark

Here's why Westinghouse Magamp regulators are proved standards for the paper industry →

WATCH WESTINGHOUSE!

*WHERE **BIG** THINGS ARE HAPPENING **TODAY!***

Automatic speed and tension control boost finishing machine production

In winding operations, costly time-consuming paper breaks, spoilage and unevenly wound rolls are minimized with Westinghouse Magamp regulators. They provide smooth acceleration and deceleration under current-limit control. Where electric braking is used, Magamp automatically holds constant tension over the operating cycle as the roll on the unwind stand changes its diameter.

Supercalender production is also boosted with Magamp. Controlled tension during acceleration and deceleration reduces paper spoilage and cuts time needed to get your supercalender from threading to productive speed. One man has complete control of the drive from one operator's station.

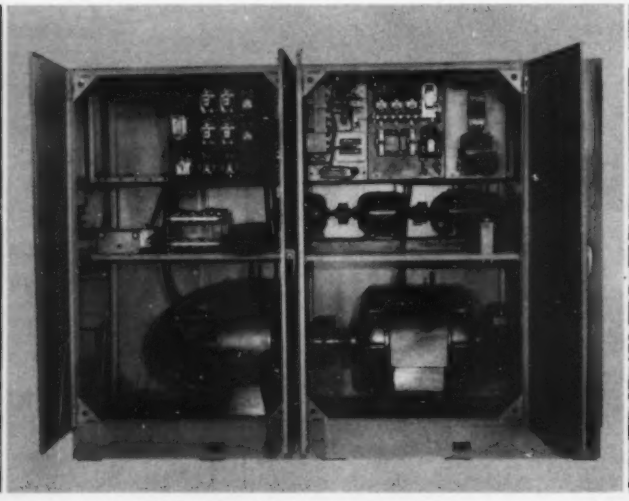
Magamp regulators are ideal for paper finishing and converting processes requiring tandem operation of several machine sections. Included here are coaters, corrugators, winders, roofing machines, and others such as combination paper-treating and air-drying equipment.

Magamp regulators are reliable, provide high gain and quick response . . . with virtually no maintenance. They are rugged, efficient, completely static . . . have no moving parts. Magamp units are panel mounted and factory wired for easy installation.

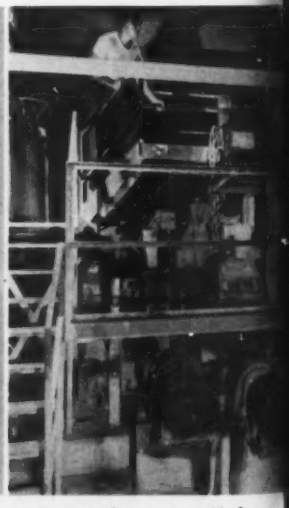
WATCH WESTINGHOUSE!

*WHERE **BIG** THINGS ARE HAPPENING **TODAY!***

On single or double-facer corrugators, constant speed relationship between adhesive roll and board speed is automatically controlled over the entire operating range.



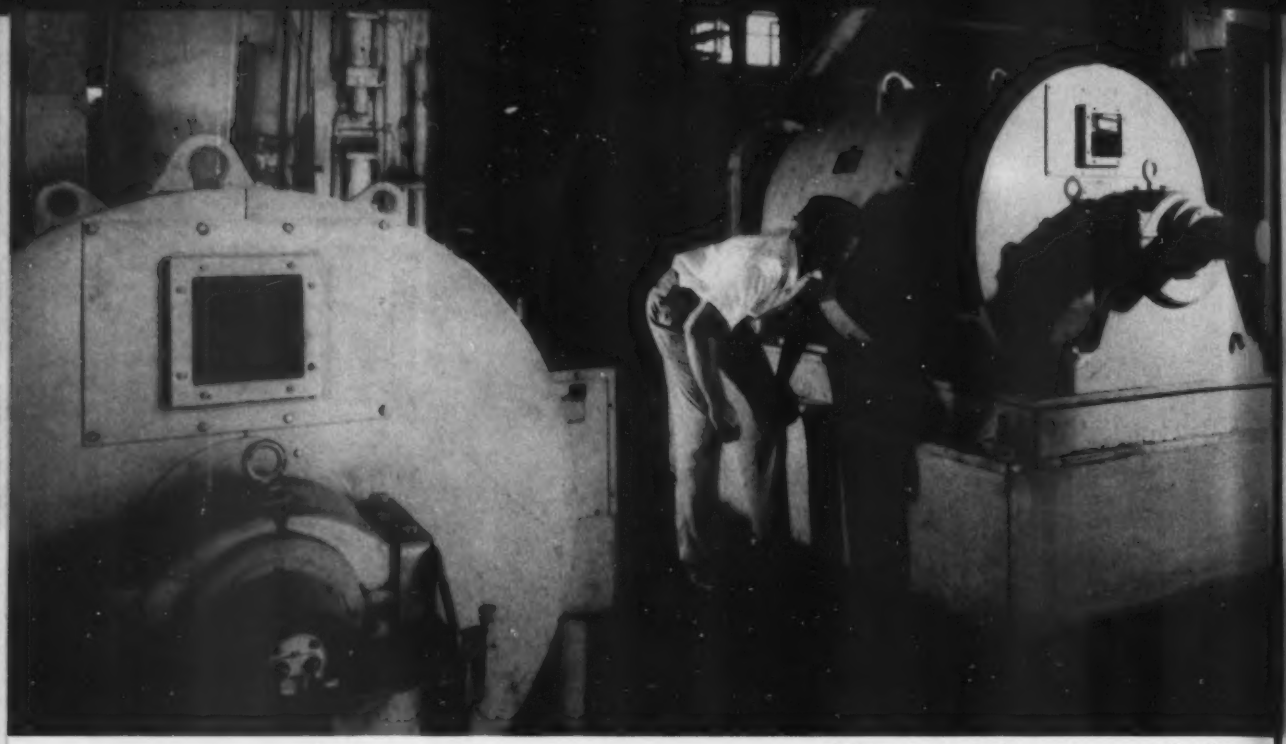
AV Drives with Magamps provide versatile speed adjustment, easily adjustable from inching speeds for setups and threading to fast runs for high production. No tubes to replace — no moving regulator parts to wear out.



Magamp regulators applied to coater drives assure accurate speed matching over the operating range. Once set, Magamp automatically maintains correct speed with no further attention from operator.

On supercalenders, Magamp regulators provide uniform threading speed and permit smooth transition to operating speed. They lower operating costs by minimizing cuts and sheet wrinkles, even at maximum speeds.

Magamp panel mounted inside control cubicle (inset top right) has high amplification characteristics which make it an accurate, effective control device. Complete control of supercalender achieved from one operator's station.



Mile-a-minute single motor-type winder drive wi electric braking unit on the unwind stand. Conside power and maintenance savings will result in oper of the drive with this combination.

Mile-a-minute winder produces finished rolls faster

Speeds of better than a mile a minute are now possible with winders equipped with Westinghouse magnetic amplifier regulators. This simplified control provides more convenient operation, improved drive performance, lower operating costs. Result: more finished rolls . . . faster.

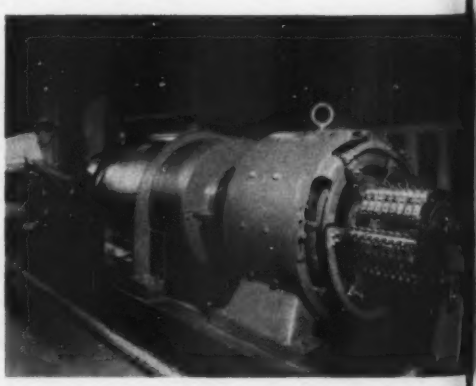
Westinghouse drives maintain speed accurately and hold uniform sheet tension automatically, thereby reducing unevenly wound rolls and off-quality paper. Smooth control of acceleration and deceleration reduces breakage and outage time for rethreading.

An experienced Westinghouse team will work with your engineering staff and consulting engineers in setting up your drive assemblies. Westinghouse designs and manufactures all the electric equipment including speed reducers for complete drives . . . and accepts undivided responsibility for the drive's successful operation.

Contact your Westinghouse sales office for further details. Or write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania.

Operator's station provides centralized control of all winder operations. A main control cubicle provides all magnetic control including the Magamps.

The Westinghouse coordinated winder m-g set design is demonstrated by this assembly. Main d-c generator in foreground, a-c synchronous drive motor, booster for braking generator and exciter for complete drive.



WATCH WESTINGHOUSE!

*WHERE **BIG** THINGS ARE HAPPENING **TODAY!***

MP-30

Powell Lubricated Plug Valves

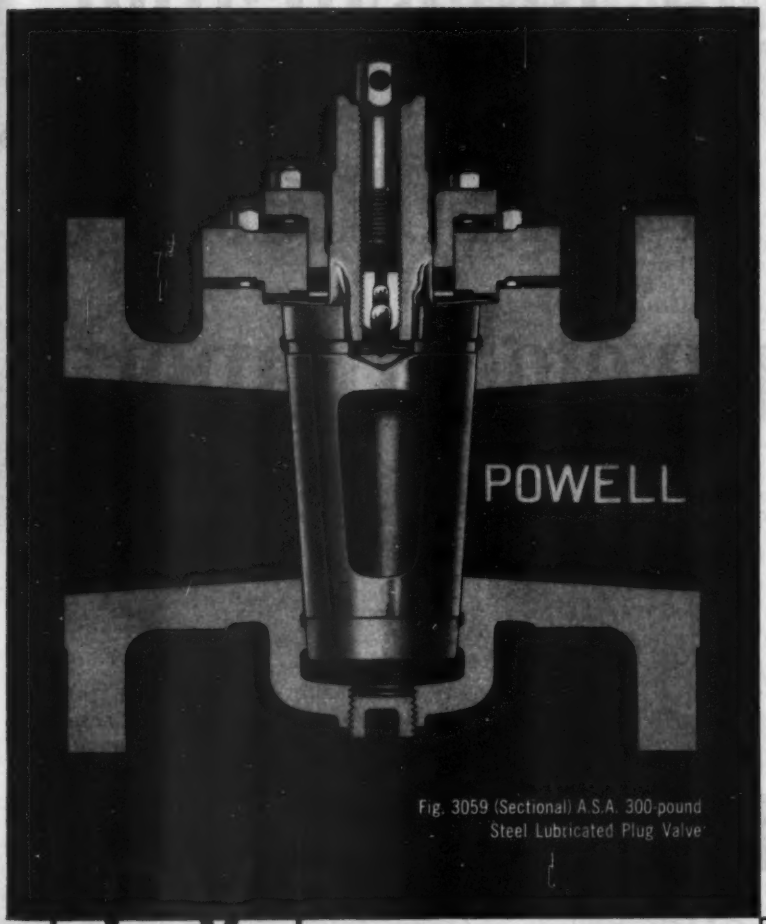


Fig. 3059 (Sectional) A.S.A. 300-pound Steel Lubricated Plug Valve

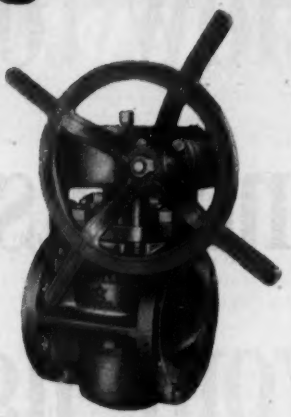


FIG. 1559G—150-pound Steel Lubricated Plug Valve. Gear operated

FIG. 2200—175-pound W.O.G. Semi-Steel Lubricated Plug Valve

IV VERIFIED

Powell Lubricated Plug Valves maintain the 110-year tradition of quality and precision. Only the finest available materials are used. And painstaking quality control is rigidly enforced through each and every step of manufacture.

Valve users who want one source of supply for lubricated plug as well as all types of bronze, iron, steel and corrosion-resistant valves will want full details on Powell Lubricated Plug Valves.

For example, features include quick and positive operation—just a quarter-turn to open or close. Lubricant grooves surrounding each port provide a positive seal when the valve is closed. In an open position, seating surfaces are not exposed. Available in Steel and Semi-Steel through distributors in principal cities.

For full details, write for the new PV-4 Catalog on Powell Lubricated Plug Valves. Just fill out the coupon and mail. Of course there's no charge, no obligation.

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Cincinnati 22, Ohio

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Completely non-tacky, the Kelgins and Kelsize S appreciably improve machine operation and reduce "set-asides" caused by picking on the driers and calender rolls. You produce higher quality lightweight papers at faster machine speeds than ever before. If you make lightweights, the Kelgins and Kelsize S, test-proven for easy operation and high quality production, are worth your quick consideration.

YOURS ON REQUEST: Free Sample of the Kelgins and Kelsize S, *plus* new Surface Sizing Technical Bulletin. Without obligation, write today to your nearest Kelco regional office.

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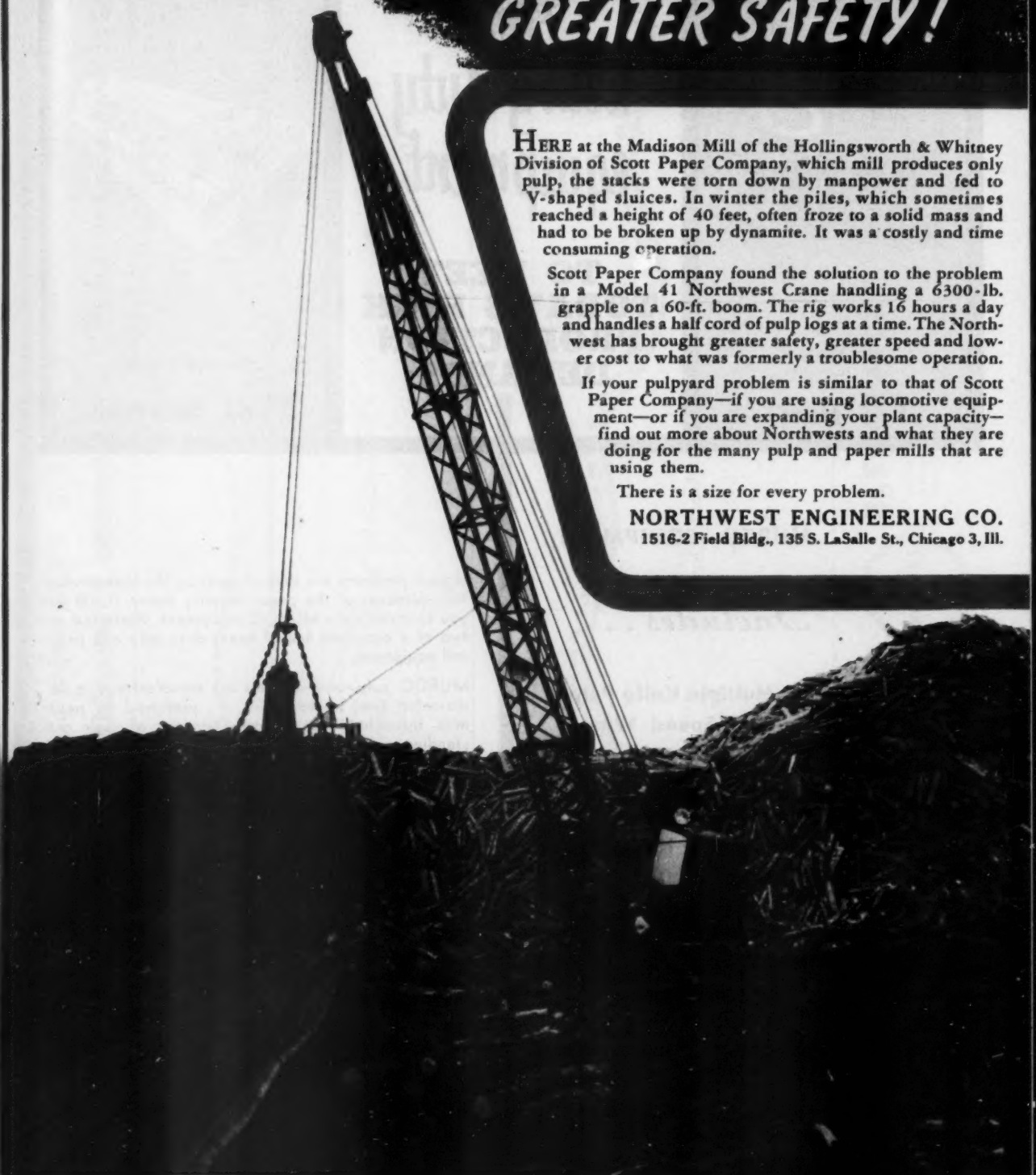
HANDLING MOUNTAINS OF PULPWOOD with GREATER SAFETY!



HERE at the Madison Mill of the Hollingsworth & Whitney Division of Scott Paper Company, which mill produces only pulp, the stacks were torn down by manpower and fed to V-shaped sluices. In winter the piles, which sometimes reached a height of 40 feet, often froze to a solid mass and had to be broken up by dynamite. It was a costly and time consuming operation.

Scott Paper Company found the solution to the problem in a Model 41 Northwest Crane handling a 6300-lb. grapple on a 60-ft. boom. The rig works 16 hours a day and handles a half cord of pulp logs at a time. The Northwest has brought greater safety, greater speed and lower cost to what was formerly a troublesome operation.

If your pulpyard problem is similar to that of Scott Paper Company—if you are using locomotive equipment—or if you are expanding your plant capacity—find out more about Northwests and what they are doing for the many pulp and paper mills that are using them.

There is a size for every problem.

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The Crane That Goes Anywhere

10 to 50 TONS

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MURCO EQUIPMENT

Includes . . .

Barking Drums • Multiple Knife Pulpwood Chippers • High-Speed Wastewood Chippers • Small Log Chippers Re-Chippers • Multiple Knife Chipper Discs • V-Type Spouts for Pulpwood Chippers • Chip Crushers • Knot Drills • Level Vibrating Double Deck Chip Screens • Knot Screens • Stainless Steel Flat Screens • Pulpwood Slashers • Hydraulic Wood Splitters • Quick Opening Gate Valves • Roll Heading Machines • Pneumatic Winder Shafts • Mechanical Winder Shafts • Hydraulic Roll Lowering Tables • Power Dam Gate Hoists *Plus* • GRID Unit Heaters • GRID Blast Heaters • GRID Radiators

If your problems are that of meeting the high production demands of the paper industry today, it will pay you to investigate MURCO equipment. Illustrated are two of a complete line of heavy duty pulp and paper mill equipment.

MURCO pulpwood chippers are manufactured in 36" diameter discs up to 153" . . . preferred by paper mills throughout the country because of their outstanding performance, producing more and better chips at less cost, with less sawdust and slivers, free from repairs while at the same time having production records of 100 cords or over per hour.

MURCO Stainless Steel Flat Screen is designed for use on either Fourdrinier or cylinder machines and particularly adaptable for running different colors and grades of paper and board stock—any operation where cleaning and preparing the screen for the next run demands continuous operation without loss of time . . . vat box tilts for rapid plate change or washing out . . . all parts in contact with paper are stainless steel. Built for 8, 10, 12 and 14 plates.

Write for complete catalog details on any pulp and paper mill equipment, proposal and quotation to meet your mill requirements.

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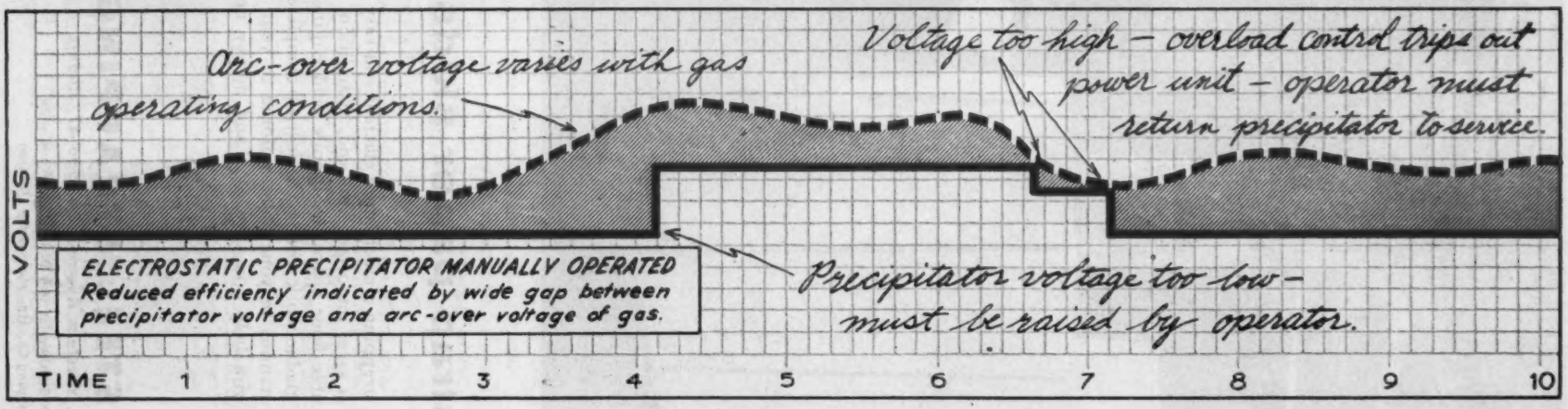
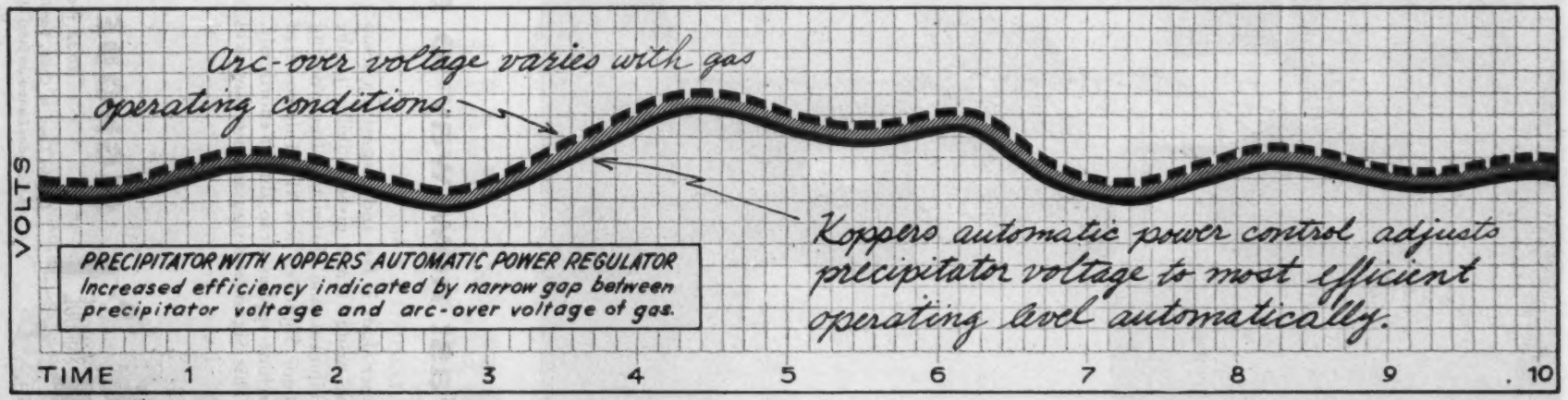
Manufacturers Since 1883

WAUSAU, WISCONSIN

EFFICIENCY GRAPHS: Comparative graphs show the relative difference between MANUAL and AUTOMATIC power operation for electrostatic precipitators


Arc-over voltage varies with gas operating conditions.
Voltage too high – overload control trips out power unit – operator must return precipitator to service.
VOLTS
ELECTROSTATIC PRECIPITATOR MANUALLY OPERATED
Reduced efficiency indicated by wide gap between precipitator voltage and arc-over voltage of gas.
Precipitator voltage too low – must be raised by operator.
TIME 1 2 3 4 5 6 7 8 9 10


Arc-over voltage varies with gas operating conditions.
VOLTS
PRECIPITATOR WITH KOPPERS AUTOMATIC POWER REGULATOR
Increased efficiency indicated by narrow gap between precipitator voltage and arc-over voltage of gas.
Koppers automatic power control adjusts precipitator voltage to most efficient operating level automatically.
TIME 1 2 3 4 5 6 7 8 9 10

SEND FOR FREE BULLETIN

Free bulletin shows in detail how this compact cabinet unit reduces wasteful "sparkover" and enables Koppers Precipitators to operate continually at peak efficiency voltage without frequent "trip-outs." See how this new Koppers Automatic Power Regulator eliminates need for constant personal attention. For bulletin M40 . . . or if you desire an analysis, or recommendation for your operation . . . write to Koppers Company, Inc., *Industrial Gas Cleaning Dept.*, 4610 Scott St., Baltimore 3, Md.

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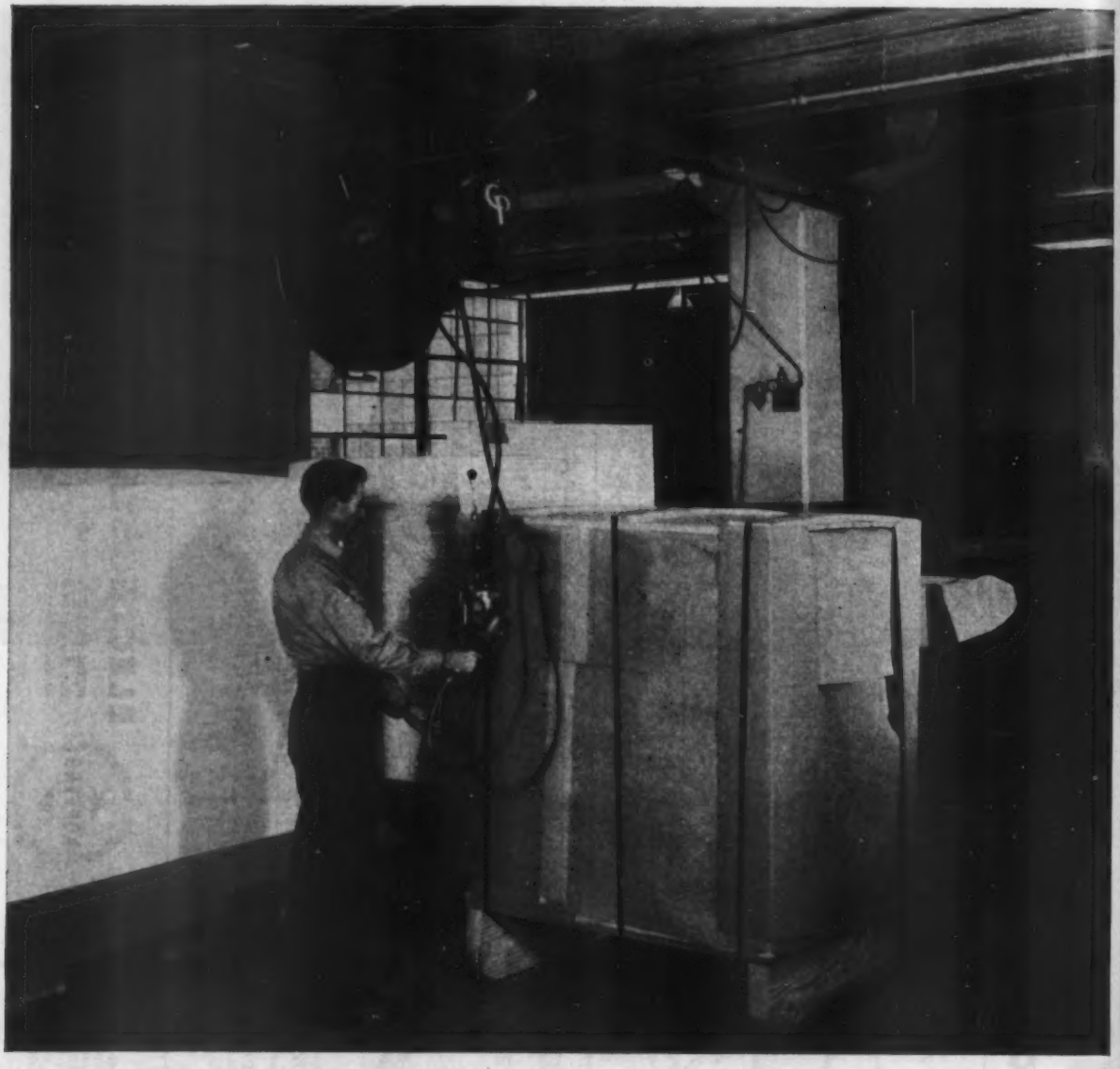
METAL PRODUCTS DIVISION • KOPPERS COMPANY, INC. • BALTIMORE 3, MD. This Koppers Division also supplies industry with Fast's Couplings, American Hammered Industrial Piston and Sealing Rings, Aeromaster Fans, Gas Apparatus. *Engineered* Products Sold with Service.



Fast new way to strap paper skids

Strapping paper skids is fast and easy with a setup like this. The bridge crane gives mobility to the strapping equipment, and obstruction-free working space on the floor. Signode's new AP-34 air-powered strapping machine applies strap almost effortlessly, in seconds. This Signode design setup makes skid strapping a much more efficient and easy operation. It saves important time and, in addition, frees valuable floor space. A Signode field engineer will be glad to work with you to develop complete strapping stations in your plant, tailored to your needs. Let him help you save time and money now. Write:

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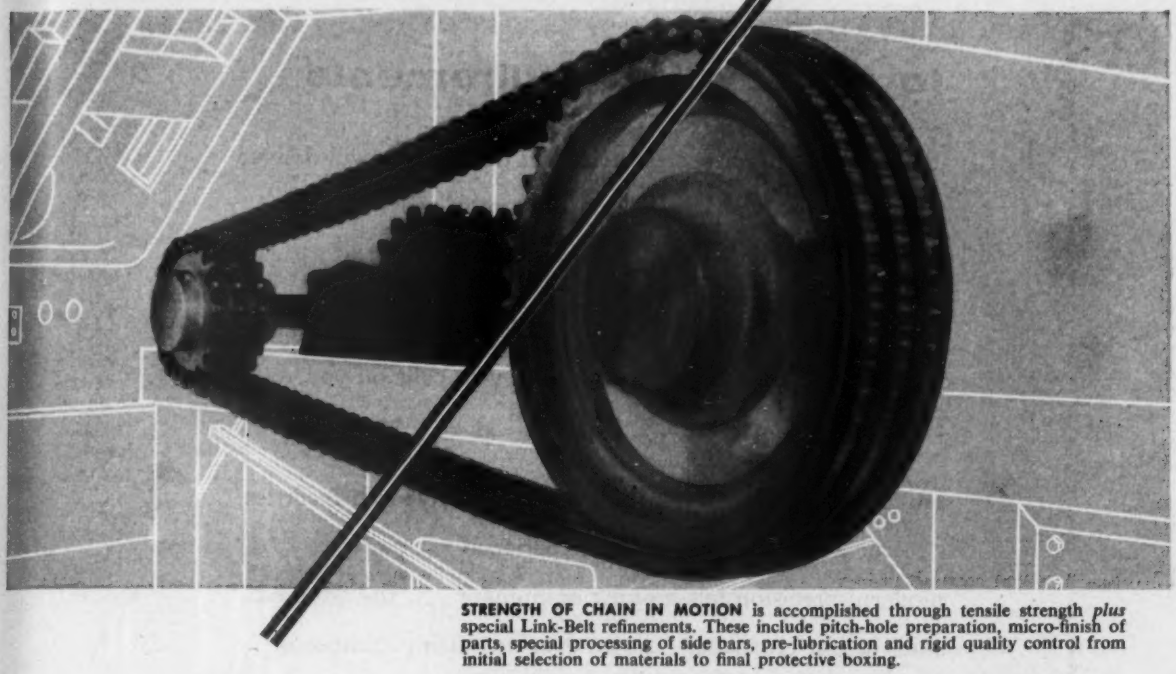
Not just static strength, but . . .

RESISTANCE TO TENSILE STRESS is achieved by use of properly heat-treated, accurately-machined side bars made of premium steel and fitted with properly-hardened pins, bushings and rollers. But to resist *operational* stresses, additional controls over dimensional accuracy, uniformity and roller resiliency are essential.



STRENGTH OF CHAIN IN MOTION is accomplished through tensile strength *plus* special Link-Belt refinements. These include pitch-hole preparation, micro-finish of parts, special processing of side bars, pre-lubrication and rigid quality control from initial selection of materials to final protective boxing.

dynamic strength

assures longer work-life for LINK-BELT Roller Chain

In addition to known tensile loads, roller chain in motion is frequently subject to other operating stresses. Engagement with sprockets . . . shock of starting loads . . . centrifugal loads—there are many similar stresses.

Link-Belt's solution: greater dynamic strength, achieved through design, manufacturing and processing "extras" . . . plus a combination of other important refinements. And you see the results in smoother, more efficient performance that lasts measurably beyond the life of ordinary roller chain—cuts your drive and conveying costs.

Near you is a Link-Belt office or authorized stock-carrying distributor where you can get full information on the complete Link-Belt range of single and multiple widths, ¼ to 3-inch standard pitch, and 1 to 3-inch double pitch. Ask for your copy of 148-page Data Book 2457.

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LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,121

LINK-BELT gives you dynamic strength that comes from these important EXTRAS

PRE-STRESSING of multiple width chain provides uniform load distribution.

SHOT-PEENED ROLLERS have greater fatigue life, added ability to withstand impact.

CLOSER HEAT-TREAT CONTROL —coupled with rigid testing insures uniformity.

LOCK-TYPE BUSHINGS (applied on a range of sizes) end a cause of stiff chain.

to meet your requirements

To design and produce the felts *you* need which will deliver the results *you* want . . . that's the aim of the Appleton Woolen Mills.

Talk over your problems of felt application and performance with the Appleton man who calls on you. His aim is to be helpful.

He offers you the services of our creative research facilities . . . our many years of design experience . . . our modern, precision felt-making equipment . . . the devoted skills of our craftsmen. As an ever-increasing number of mills are learning, you get *more* than felts from Appleton.

TEACHER-STUDENT—*When Technical Director Lee Barlament talks felt design and manufacturing with son Bob, he calls on 32 years of experience with Appleton Woolen Mills. Young men like Bob—an engineer in our manufacturing department—are fortunate to have practical veterans to teach them the fine art of felt making.*

Appleton felts

1881 75 years 1956

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a working partner with the paper industry
APPLETON, WISCONSIN

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GWS-ND POWDER SPECIAL

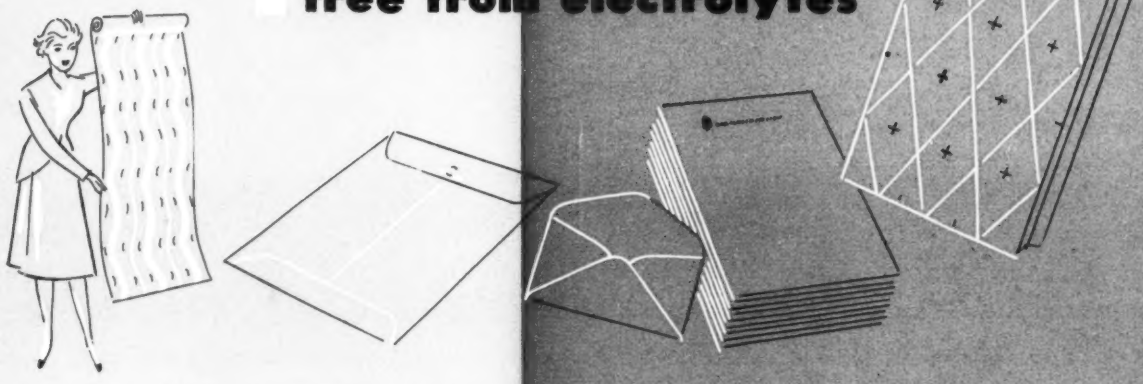
HELIOGEN BLUE
BWSN-ND POWDER SPECIAL

TO ALL THE WELL-KNOWN

HELIOGEN® QUALITIES

NOW ADD **non-dusting**

free from electrolytes



All the established advantages of a Heliogen Pigment are now offered in new Green and Blue Powders—with a *special* difference. They are now standardized in non-dusting form, without electrolytes . . . two features *together* for the first time.

These copper-phthalocyanine pigments are justly famous for their excellent fastness to light and superior chemical resistance. The new ND Powder Specials bring these qualities into wider fields of application, where the shade and coloring value of a Heliogen are desirable. The anion-active and non-dusting agents allow ready and uniform dispersion in water—for immediate coloring of paper pulp in the mass. In emulsions and water-coating systems, a Heliogen is recommended for use without fear of flocculation or coagulation by electrolytes.

For delicate tinting or for full shades—the Heliogen colors merit your attention. They offer new coloring applications on your papers—whether printing wallpaper or coloring fine or coarse papers—safeguarding them against bleaches and even against ink eradicators.

Ample supplies of Heliogen Green and Blue—in the new form—are available for immediate shipment. Your paper-coloring needs deserve a test of the *thoroughness*—in meeting color problems—now offered by the Heliogen colors. For further information or our free specifications booklet, call upon the services of our Technical Department or contact our nearest sales office.

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Let an APPLETON representative help *you!* He has an unmatched record of problem-solving.

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APPLETON, WISCONSIN

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MACHINE KNIVES

Built-in endurance for your job! Atkins offers a complete line of machine knives... ...a knife for every job.

Silver Steel Scientifically analyzed and specially processed for each particular cutting requirement.

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Precision Ground All Atkins knives are precision ground on the most modern machines available. Accuracy in beveling and keen cutting edges are always assured.

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Feature articles

Closed-circuit TV in the pulp and paper industry

LEO WALTER

Closed-circuit TV permits forest fire detection and visual observation (from a central point) of the interior of boiler and recovery furnaces, kilns, vital sections of the paper machine, material handling operations, log transportation and handling, etc.

CLOSED-CIRCUIT television has established itself in many branches of industry as the modern means of extending vision in the plant. Industrial television permits a plant supervisor or operator to view one or more scenes or operations simultaneously from a remote position. Although several hundred ITV systems are now in use, many potential users in the pulp and paper industry scarcely know what the equipment can do for them.

The developing techniques of industrial wired television have brought to the pulp and paper industry a new tool which has great potentialities. So far, these potentialities have not been widely realized in the paper mill. What are the practical uses of television? The roles are divided into the following fields:

(1) Where it would be impossible or dangerous to employ a human observer: inside boiler furnaces, kilns, etc.

(2) Where several observers would be required and can be replaced by an equal number of cameras bringing the image to a central point: sections of a paper machine, material handling operations, marshalling of railway cars, log transportation and handling, and the like.

(3) To see further than is possible with the naked eye: detection of forest fires, observation of traffic on roads, in tunnels, seeing into ships' holds during loading and unloading, guarding of remote timber yards against pilfering, etc.

Other uses of ITV use a magnifying microscope the findings of which can be televised outside the laboratory into the mill. The use for training and educational purposes, or "for taking visitors on tour" without leaving an audience room are other possibilities.

Equipment in use

Closed-circuit television, as its name implies, is a means of transmitting a picture from a camera to a screen by means of a cable or a telecommunication system.

The basic principle is simple (Fig. 1). A small-size light-weight TV camera is connected by co-axial cable to a control unit, and the latter serves one or several monitors. Alternatively, several cameras and control units can serve via a switching unit a single monitor or viewer in a central office. Modern ITV equipment is designed for ease of operation and maintenance, and is adaptable to meet unusual requirements. Provided that light is reasonable and distance adequate, clear pictures can be expected on the monitor screen, either in black and white or more recently in full color.

One of the leading makers (R.C.A.) lists the following main categories of ITV applications:

(1) Visual inspection, used for industrial processes, machine observation, instruments, furnace combustion conditions, material handling operations, engine and material testing.

(2) Surveillance of plant and equipment.

(3) Traffic control.

(4) Transmission of information and visual telemetering.

(5) Educational and training.

From the great variety of possible uses in the pulp and paper making industry, and in general industrial use a few have been selected at random in the following.

Current uses

ITV had its first practical applications in the power and boiler-house, providing remote observation of boiler-water level (Fig. 2) and of boiler furnace conditions. Visual supervision of smoke emission from

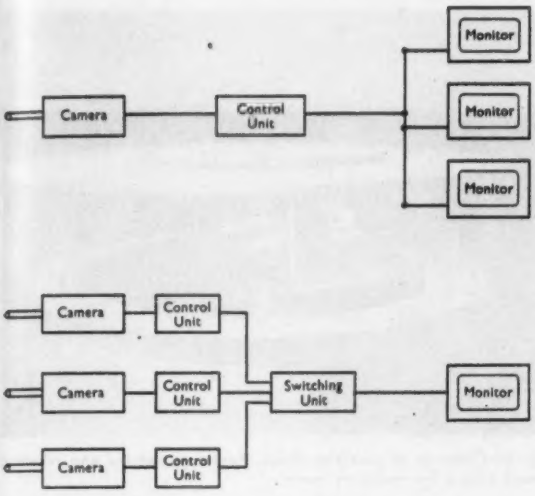

Fig. 1—Basic principle of a closed circuit television system

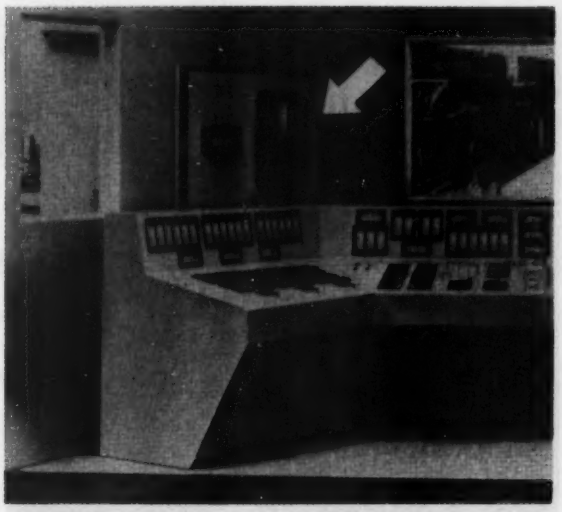

Fig. 2—Bailey boiler-steam turbine control desk with "Levelscope" televizing water level

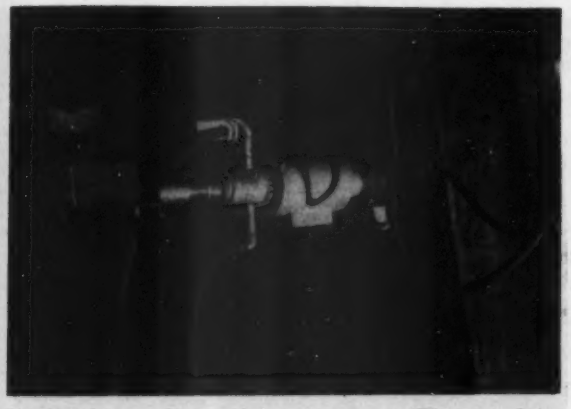

Fig. 3—Water- and air-cooled periscope and ITV camera being oriented for furnace viewing purposes

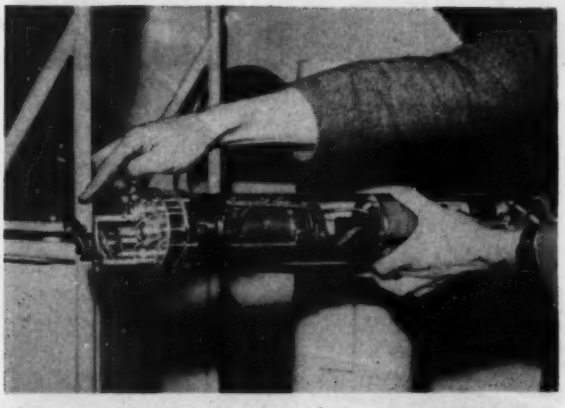

Fig. 4—Pye camera, seen with steel casing removed, is of extremely small diameter, can be slipped into digesters, etc.

boilerhouse stacks followed. Remote observation of boilerhouse instruments during test periods is another use, saving much time and moving about of test engineers. One of the most interesting developments for internal inspection of boiler furnaces, industrial furnaces and kiln firing is a new instrument developed in co-operation between the British Iron and Steel Research Association (B.I.S.R.A.), the Babcock and Wilcox organization and the makers of the instrument, Foster Instrument Co. Ltd., Letchworth, England. The combination of the B.I.S.R.A. water and air-cooled periscope, which can be oriented for furnace interior viewing over a wide angle, with a Marconi ITV camera (Fig. 3), is claimed to lay open furnace operation during firing, kilning, etc. A monitor screen on an instrument panel enables a control engineer at a central control panel (or any other convenient point) to maintain continuous supervision of all burners in a boiler, industrial furnace, kiln and the like. The picture taken is from the Marconi monitor screen at the initial stage of a furnace firing operation. The oil burners are alight, ready for ignition of the jet-injected pulverized coal as soon as it is admitted to the furnace.

A Pye camera developed for visual inspection of "hot" regions in a nuclear reactor is of extremely small diameter, and can probably be slipped into pulp and paper making equipment, such as digestors through a man-hole or hand-hole. This camera (believed to be the first of its kind in the world) is illustrated in Fig. 4. The diameter is small enough to enable the camera to be lowered into the heart of a graphite-moderated nuclear reactor through the narrow "fuel" loading channels that form a lattice work in the surrounding graphite. The camera can be lowered by means of a cable contained in a rubber hose 75 ft. long. Carbon dioxide pumped through the hose will keep the camera mechanism at 50° C in a reactor temperature of about 200° C.

The new form of visual telemetering of instrument readings can be performed with all ITV cameras, and is especially valuable when running in a remotely located new machine somewhere in a plant, or for supervision of events outside the mill.

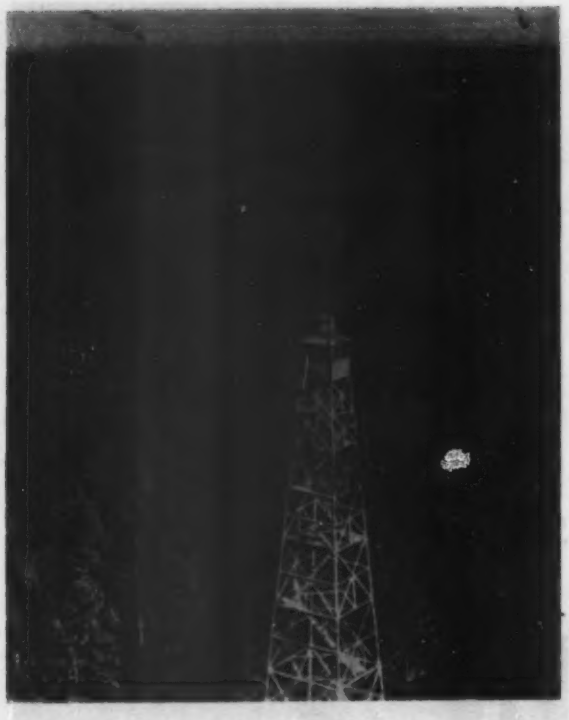

Fig. 5—(left) Fire watching tower with ITV camera, microwave transmitter and parabola

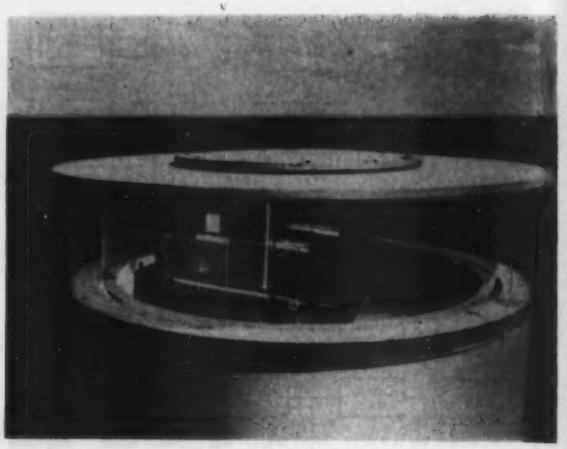

Fig. 6—Close-up of plexiglas dome, Raytheon camera and rotating mount atop a fire watching tower

Fig. 7—Installation of Raytheon microwave equipment on roof of central observation building

Fig. 8—ITV equipment used with microscope to produce enlarged image on monitor screen

Many opportunities should present themselves to the progressive papermaker for remote observation of process machinery in the mill. For example, remote observation which enables attendant two floors away to view operation of paper-pulp washing tank, is provided by R.C.A. "TV Eye" closed-circuit television system at Spotswood, N. J., plant of Peter J. Schweitzer Inc., one of the nation's largest producers of cigarette paper. (See page 1106 in March issue of the PAPER INDUSTRY.) Heretofore, attendant in charge of various pulp-preparation machines was required to make periodic trips to check the washing tank for signs of pile-up, which could jam and cause costly shutdown of equipment. Both monitor and TV camera are enclosed in pressurized transparent cases to assure maximum picture clarity despite heavy moisture in atmosphere.

ITV and microwave link

Of special interest to pulp mills in U.S.A. and Canada is a new system for watching forest fires developed by Raytheon Mfg. Co., Waltham, Mass. The makers of this combined ITV-microwave system claim that surveillance by means of a television camera and a Raytheon KTR-100 microwave connecting link eliminates all the problems of patrolling remote locations with the attendant complications and cost of housing, supply, relief, transportation, communication, etc.

The system utilizes existing fire control towers. An industrial television camera is mounted in a plexi-

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Organic coatings for paper

Part VI. Water soluble organic coatings—polyvinyl alcohol, methyl cellulose, carboxymethylcellulose, sodium alginate. Spirit varnishes—natural resins, zein

WATER SOLUBLE or water dispersible organic materials were discussed as adhesives for inorganic coatings in the August issue of The PAPER INDUSTRY. Certain types of these materials, discussed in this article, are used as coatings in their own right. In general, these materials are characterized by excellent grease resistance; they show, however, poor moisture and moisture vapor transmission resistance.

Included in the category of water soluble or water dispersible resins are polyvinyl alcohol, methyl cellulose, carboxymethylcellulose, and sodium alginate. These coatings are of value as prime coats or sizing coats to provide "hold-out" for subsequent films which may be applied. They are also used as thickening agents for water dispersions or latices. In certain instances, they are also used alone as coatings.

Water-soluble organic coatings are generally characterized by excellent grease resistance but show poor moisture or moisture vapor resistance

Polyvinyl alcohol

Polyvinyl alcohol is produced either by the acid or alkaline hydrolysis of polyvinyl acetate. Polyvinyl alcohol forms a colloidal solution in water and in hydrophilic materials such as glycerol, ethylene glycol, and formamide. It is insoluble in most organic solvents including ketones, ethers, esters, hydrocarbons, and monohydric alcohols. Accordingly, polyvinyl alcohol films are not affected by organic solvents. They are also resistant to oils and greases. The films are sufficiently tough and elastic so that unsupported films can be made. These films, in addition to being exceedingly tough, show a high degree of impermeability to gases such as hydrogen, carbon dioxide, oxygen, and nitrogen.

Polyvinyl alcohol is available in several viscosity grades, and these depend on molecular weight and on the degree of hydrolysis.

Water soluble materials may be used to modify polyvinyl alcohol films. Glycerol is an important plasticizer. Starch, polyglycols, dextrin, invert sugar, and casein are all used as extenders. Gelatin and the water soluble forms of thermosetting resins, such as urea-formaldehyde and melamine-formaldehyde are also used as extenders for polyvinyl alcohol films. The addition of the urea and melamine formaldehyde resins is especially important where increased wet strength is desired.

Polyvinyl alcohol coatings are used to increase the strength and flexibility of bond, ledger, index, blueprint, and other high quality papers. Glassine paper coated with polyvinyl alcohol also has improved strength as well as greater transparency, better gloss, greater grease resistance, and better dimensional stability. It is less affected by humidity and by aging, since the polyvinyl alcohol is less hydroscopic than some of the other film formers used for transparentizing glassine.

Polyvinyl alcohol is also used as a size coat to prevent asphalt in paperboard from bleeding through when the surface of the board is lacquered or varnished.

Methyl cellulose

Methyl cellulose is manufactured by reacting cellulose with sodium hydroxide and methyl chloride. It is solubie in cold water and insoluble in hot water and in organic solvents. Thus, like polyvinyl alcohol, it provides a solvent resistant and grease proof coating. It is also resistant to dilute acids and alkalis. Like polyvinyl alcohol, it may be used as a sizing agent to prevent penetration of waxes, lacquers, varnishes, and inks into paper, Thus it increases the effectiveness of these coatings by decreasing their penetration.

Methyl cellulose is a good adhesive and can be used to bond wax paper to fiberboard. Thus it serves the double purpose of being a grease proofing agent as well as a bonding agent.

Like polyvinyl alcohol, methyl cellulose is compatible with urea and melamine-formaldehyde resins, and such combinations have improved the moisture and moisture vapor resistant properties as compared with methyl cellulose alone. Glyoxal is also a water insolubilizing agent for methyl cellulose.

Methyl cellulose may be used in combinations with other water soluble materials such as glycerol, sugars, starch, and gums, which serve as plasticizers and extenders. It is

also a thickening agent for emulsions which are to be used for paper coatings. Like polyvinyl alcohol, it is nonionic and thus can be used with cationic, anionic, and nonionic water dispersions.

Sodium carboxymethylcellulose

Sodium carboxymethylcellulose is manufactured by the interaction of cellulose, sodium hydroxide, and chloracetic acid. Like polyvinyl alcohol and methyl cellulose, it provides films which are resistant to oils, waxes, fats, chemicals, and organic solvents. Unlike these other two materials, however, it is anionic, and accordingly can be used as a thickener with anionic or nonionic emulsions only. For the same reason, modifiers added to it must be either nonionic or anionic.

In general, the uses and properties of sodium carboxymethylcellulose are similar to the uses and properties of methyl cellulose and polyvinyl alcohol. Carboxymethylcellulose readily dissolves in water. Water solutions will tolerate alcohol, which is an advantage to the paper coater since water alcohol solutions will dry faster and will not wet the paper excessively.

Modifiers of carboxymethylcellulose include all of the water soluble gums, starch, casein, soaps, wetting agents, and sodium silicate. It is also compatible with plasticizers such as glycerol and glycol; and like methyl cellulose and polyvinyl alcohol, water resistance can be improved by the addition of water soluble forms of urea or melamine-formaldehyde resins. The largest uses of carboxymethylcellulose as a paper coating are as undercoatings for other surface coatings and as coatings where a high degree of grease and oil resistance is required.

Sodium alginate

Sodium alginate is a natural product isolated from the giant kelp that abounds off the coast of Southern California. Chemically, it is the sodium salt of polymannuronic acid which is classed as a polysaccharide (carbohydrate). It is non-toxic, non-allergenic and is an edible product that has wide use in the food and pharmaceutical industries. Several viscosity grades are available, and all grades dissolve easily in either hot or cold water but are insoluble in organic solvents. The aqueous solutions, like carboxymethylcellulose, will tolerate some alcohol for faster drying.

The sodium alginate is an excellent film former and is unique in its ability to inhibit penetration of aqueous solutions into porous surfaces. The film forming property is extensively used to increase ink, wax, varnish and lacquer holdout and to increase densometer reading (decrease air permeability) of paperboard and paper. As the solutions of sodium alginate are non-tacky and are non-foaming, they have special advantages for ease of use on high-speed machines. Salts of polyvalent metals (such as zinc, calcium, aluminum, etc.) will cross link the alginate to provide water insoluble films.

The sodium alginate is anionic and so can be used as a thickener and protective colloid for anionic or nonionic dispersions only. The plasticizers and additives mentioned for the other water-dispersible resins can also be used with the alginates. The low viscosity sodium alginates are quite compatible with solutions of sodium silicate and plasticizes the dry film to a considerable degree.

The alginates have unusual properties for suspending pigments such as clays, titanium dioxide, etc. and will maintain these dispersions with the adhesive in a homogeneous state.

Sodium alginate is used as a surface sizing agent on paper and paperboard, as a sizing undercoat for other surface coatings and as an additive to coatings to improve uniformity.

Spirit varnishes

Spirit varnishes are cheap coatings which derive their name from the fact that the basic resins used are soluble in ethyl or isopropyl alcohols, or in mixtures of these with inexpensive aliphatic hydrocarbons such as naphtha. The manufacture of such varnishes is quite simple since it involves only the cold cutting of the resin with the solvent. Natural resins of both insect and fossil origin have been used for many years. These solutions are applied either by roller coating or by rotograve procedures, and their widest application is for the protection and decoration of printed matter such as labels, box wrappers, catalog and book covers, and various display items. Spirit varnish coatings owe their popularity to their economy and to the gloss which they impart to paper. Their water and solvent resistance is generally quite poor, and they have a low degree of flexibility. They also tend to yellow on aging.

Natural resins

There are available numerous resins which may be used for spirit varnishes. One of the most commonly used is shellac. Shellac is the exudate from the skin glands of an insect. *Coccus lacca, or Tachardia lacca.* Much of the shellac used comes from India and is available in three grades. The lowest grade is known as orange shellac and is unbleached. The medium grade is white shellac, which is a dry bleached grade, whereas the best grade is refined bleached shellac in which the wax and alcohol insoluble matter have been removed. Shellac softens at 70-80° C. It has an acid number in the region of 50-65. It decomposes at temperatures above 100° C. While most commonly used as a solution in ethyl alcohol, it is also soluble in dilute alkali. It is very hard and provides a very brittle, though tough coating. The coating has exceedingly poor water resistance. Among its advantages are a high degree of "hold-out" on paper and good resistance to oils, greases, and gasoline. Shellac is also used in combination with nitrocellulose.

Dammar is perhaps one of the most widely used natural resins for spirit varnishes. There are various grades of dammar resins, most of which are imported from the East Indies. In general, dammar is characterized by a light color, good color retention properties, low acid number, and solubility in petroleum and aromatic hydrocarbons. When dewaxed, dammar is compatible with nitrocellulose and chlorinated rubber. The product containing wax is compatible with glyceride oils and with ethyl cellulose. The water resistance of dammar is reasonably good and the resin also has heat-sealing properties. It has very poor flexibility, but this may be improved by the addition of plasticizers such as castor oil or other vegetable oils.

Dammar, which is a gum of recent origin, has a softening point of approximately 67° C. and an acid number in the range of 17-35. The spirit varnishes are made from this gum by dissolving it in a mixture of alcohol and hydrocarbon. In addition to being used as a spirit varnish, dammar is also used in lacquers with nitrocellulose and ethyl cellulose. It is further used in wax compositions which find some application as a paper sizing material.

East India gum is a close relative to dammar. There are three grades of this gum, known respectively as pale, black, and batu. The pale grade has the best color, although this color is not as good as the color of dammar. Color retention is very good. The gum is partly soluble in

alcohol and highly soluble in aromatic and aliphatic hydrocarbons.

The East India gums are only very slightly incompatible with glyceride oils and with chlorinated rubber to which they impart excellent abrasion resistance. Their heat-seal properties and their water resistance are considered good. The pale and the black varieties have softening points in the region of 100-130° C. Their acid numbers are below 35. They are used in the paper coatings industry as spirit varnishes where the poor colors can be tolerated. They are compatible with waxes and may be used in combination with paraffin or microcrystalline wax. The batu grade of East India gum is similar to the pale grade, except that spirit varnishes of the batu variety yield nonglossy films. These films, however, demonstrate excellent adhesion and have good water abrasion resistance. East India gum is a semi-fossil resin.

The copals, another type of natural resins, have higher acid numbers than the dammars. The copals may be divided into three categories — Manila gums, Congo gums, and kauri gums. The Manila gums are either semi-fossils or else of recent or semi-recent origin. Those of recent origin are soft, while those of semi-recent origin are somewhat harder, and the semi-fossils are quite hard. All are soluble in alcohol and alkali. They have high acid numbers varying from 100 to 150. Their color is good, although like all natural resins a yellow cast tends to be present. The Manila resins are compatible with cellulose and with lacquer plasticizers such as castor oil, dibutyl phthalate, and tricresyl phosphate. Accordingly, they are used in ethyl cellulose lacquers. Manilas are also compatible with nitrocellulose. Since they are compatible with wax, they may be used in wax coatings. One of their most important uses is in spirit varnishes, where they are dissolved either in alcohol or alcohol-hydrocarbon mixtures.

Congo resins are of African origin. They are hard, oil soluble fossils with colors which vary from white to amber. Congo resins are not widely used in spirit varnishes. Their main use is as a paper size. In order to achieve good solubility, Congo resins must be heat treated or thermolyzed. This results in a dark color which is objectionable for most spirit varnishes. Thermolyzed Congo gum is compatible with ethyl cellulose and improves the gloss of this material. Because of its high acid number, Congo gum may be esterified with glycerol or pentaerythritol. Such esters may be added to resin products to improve gloss and general chemical resistance.

Kauri gum is a hard resin of fossil origin which comes from New Zealand. It varies in color from pale yellow to brown and, like Congo resin, it must be thermolyzed in order to make it compatible with most solvents and with varnish oils. It is soluble in alcohol, but insoluble in petroleum solvents. It has a high acid number of 50-80, and is compatible with ethyl cellulose and nitrocellulose prior to thermolyzation. Thus, kauri gum is used in the formulation of lacquers as well as in the preparation of spirit varnishes.

Other resinous materials of natural origin used in the praparation of spirit varnishes include accroides, elemi, mastic, and sandarac. Accroides is an alcohol soluble resin of origin which is compatible with nitrocellulose and cellulose acetate. It has a softening point in the region of 100° C. In addition to being used in spirit varnishes, it is used with waxes as a paper size and in the formulation of lacquers.

Elemi as a balsam type resin of recent origin. It is soluble in alcohols and oils, and is compatible with ethyl cellulose, nitrocellulose, and chlorinated rubber. It is used in nitrocellulose lacquers because of its plasticizing effect. It is also used in combination with waxes and as a paper sizing in addition to being used in spirit varnishes.

Mastic and sandarac are gums of recent origin. Mastic is compatible with ethyl cellulose, nitrocellulose, and chlorinated rubber. It is soluble in many solvents. Its most important use, currently, is as an overcoat for oil paintings, since it provides a pale, clear film. Sandarac, unlike mastic, is not compatible with vegetable oils but is soluble in alcohols, esters and ketones. It is compatible with ethyl cellulose and nitrocellulose.

In addition to the natural resins already discussed, numerous rosin derivitives are used in spirit varnishes. Among these are polymerized rosin and Vinsol resin. The latter is a resin obtained from pinewood and is not a resin or rosin derivitive. It is characterized by insolubility in aliphatic hydrocarbons, and consists of a complex mixture of high molecular weight methoxy phenols, some of which contain carboxyl and hydroxyl groups. Ester gums, which are the glycerol esters of rosin, are also used in spirit varnishes. Modifications of ester gums, such as the glycerol esters of hydrogenated rosins and polymerized rosin are also spirit varnish ingredients.

Unmodified alkyds of high acid number based on rosin may also be used in spirit varnishes.

Zein

Zein is a natural, alcohol soluble protein obtained from corn gluten by exraction with isopropyl alcohol. After the oil has been removed from the alcohol solution, the zein is precipitated and dried. It is a slight yellow solid which decomposes at high temperatures. It has a slight mealy odor which, for the most part, is not objectionable.

Primary solvents for zein include ethyl and isopropyl alcohol. Secondary solvents which may be combined with these primary solvents include ketones, glycol ether esters, aliphatic esters, and chlorinated hydrocarbons. Aliphatic and aromatic hydrocarbons may be used to a small degree as diluents. Zein may also be dispersed in aqueous alkali such as 0.02-0.2 normal aqueous sodium hydroxide. At higher alkali concentration solution does not occur. Thus, zein can be applied either from organic solvent or from an aqueous dispersion.

Since films of zein are hard and hornlike, plasticizers are normally used. Plasticizers include high molecular weight glycols, sulfonamides, fatty acids, amides such as acetamide, urea, glycol and glycerol esters, and half esters of dibasic acids such as monobutyl phthalate. Secondary plasticizers include phosphates and phthalates such as dibutyl phthalate. Zein is also compatible with the natural resins used in the spirit varnishes, with coumarone-indene resins, with sulfonamide resins, and with certain types of modified rosins such as hydrogenated and polymerized rosins, as well as with rosin itself.

When zein is used as a spirit varnish, it provides a coating with good grease resistance and good abrasion resistance. Since zein is non-toxic and does not possess the undesirable odor associated with natural resins, it may be used for coating food wrappers. The coating is also heat-sealing for which reason zein serves as a laminating adhesive for laminating paper to glassine, cellophane or foil. In combination with rosin, zein has been used as a shellac substitute.

Typical zein formulations

Spirit varnishes based on zein are prepared at 30-50 per cent solids

(Continued on page 590)

Truck-trailer hauling in Abitibi's pulpwood operations

Fig. 1—Mace Bay dump on Abitibi Lake. Shown is the entire winter's production from the Mace Road camps—122,426 cunits (144,030 cords, appearing as furrowed land)—awaiting the ice break-up. After break-up the logs are towed by diesel tugs in 8000-cunit rafts to the lake outlet, from where the logs will float 35 miles downriver to the Abitibi mill at Iroquois Falls

▶ Truck-trailer logging shows distinct economies. The increased efficiency of mechanized equipment — combined with improved methods — will further reduce manpower requiremnts and offset long-haul costs

FROM THE EARLIEST logging and until the 1948-49 season, all pulpwood cut on the Iroquois Falls Div. of Abitibi Power & Paper Co. Ltd. was hauled on sleighs or sloops. Although a sleigh was relatively cheap and was suited to the local climate, loads were small, and loading and unloading required a great deal of manpower (Fig. 2). Attemps at building up and hauling large loads on sleighs with mechanical power were frustrated by high frictional resistances in starting and moving loaded sleighs. In addition, enormous quantities of water had to be hauled to make efficient 'iced' roads for truck-sleigh hauling operations. On the shorter hauls (up to about 10 miles) tractors with trains of sleighs were relatively inexpensive (Fig. 3), but with increasing distances and rapidly increasing labor costs it is now apparent that truck-trailer hauling with mechanical loading and unloading offers the best costs per cunit-mile for any distance where a truck can operate efficiently.

There are 120 miles of company-built all-weather roads within the timber limits, 100 miles of which were built since 1948. Most of the road system is designed for a dual purpose; that is, for hauling men and supplies to the camps and for hauling pulpwood from the cutting areas to the company's newsprint mill at Iroquois Falls, Ont. or to the winter landings on Lake Abitibi and its tributaries. Since 1948, truck-trailer hauling has been expanded each season until in the season 1955-56 the entire limit production of some 215,000 cunits was hauled an average distance of 23.6 miles on truck-trailers. (1 cunit = 100 cu. ft. solid wood.)

Description of method

The method used in 1955-56 was to first blaze out, or mark, road locations 1000 ft. apart. Next, the timber was cut to a width of 500 ft. on each side and skidded with horses to a cleared strip along the center line. Logs were cut in 16½-ft. lengths and piled in a continuous skidway at right angles to the center line (Fig. 4). After the wood was placed "in skidways", a Caterpillar D7 bulldozer was used to make a 20-ft. roadway along one side of the skidway. The roadway was next "smoothed up" by a tractor pulling a drag, and, after good frost penetration, the road was further smoothed with a motor patrol grader.

Roads are joined together forming "loops" as the roads are not wide enough for the trucking units to pass or to turn around. Logs are loaded by a 1¼-yd. Dominion crawler crane with a 45-ft. boom and a long grapple capable of loading 1 cunit to a "lift". The cranes are equipped with a "tagmaster" which allows the operator to position the log grapple. At present a hauling unit is used made up of a B60 Mack tandem axle truck with a Fruchauf TL55 10-cunit semi-trailer. Trailers have Warner electric brakes, and the trucks have Bendix-Westinghouse air brakes. Trailers are fastened to the trucks with an Apgar safety fifty wheel. The loading crew consists of the crane operator and one groundman who signals the crane operator and positions any logs not firmly within the *stakes* through the use of a pike pole. Seven to 11 cunits are hauled per trip; loading time is approximately 1 min. per cunit. Speed on bush roads is held to about 10 mph, but speed on the main road, a graded road of double width, is the governed speed of the unit (approximately 40 mph), with slower speeds at bridges and danger points. Three methods of unloading are employed: the wood from the western district is hauled to the mill and unloaded on to a slasher table with a crane and grapple; in the central district the wood is unloaded onto the ice of the Circle River using slings and a double-drum winch mounted on a D6 tractor; in the eastern district the wood is pushed off the truck-trailer using an Allis-Chalmers HD7 tractor with locally-built pusher (Fig. 5).

Fig. 2—Old fashioned logging—the logs on the sleigh were loaded by a teamster and his helper for transport to the Abitibi logging railway, now replaced by a truck-trailer haul direct to the Iroquois newsprint mill

Fig. 3—Tractor-hauling on sleighs. Note the large number of empty sleighs in the background. The logs were horse-hauled to the main road

Fig. 4—1955-56 hauling method—a Fruehauf TL55 trailer being loaded by a Dominion 1¼-yd. crane. Note position of the skidway and note also in the background the advance growth remaining after the area has been cut and skidded with horses

Fig. 5—At work on the ice surface of Lake Abitibi—a truck-trailer being unloaded by tractor-pusher on Mace Bay dump. The ice surface is kept rolled to compress the snow and permit frost penetration to build up a thick ice sheet

Savings in man power

The effect of the foregoing mechanical method of delivering wood can best be shown in the following table. There has been a continued increase in efficiency from year to year. For our purpose three years' data are given commencing with the year before truck-trailer hauling began, 1947-1948, and ending with 1955-1956, when the total production was hauled by truck-trailers.

As illustrated in the table, the mechanization program has brought about a reduction of 39.5 per cent and 18 per cent respectively in the relative number of man-days and horse-days required on the operations. In the 1955-56 program these reductions amounted to 124,343 man-days and 12,465 horse-days.

In addition, hauling distances have been quadrupled. The 1955-56 production was hauled 3,709,000 cunit miles farther than it would have been in the 1947-48 season.

Production Data

Season	Limit Production Cunits	Average Length of Haul Miles	Effective Days Worked: Man Days	Horse Days	Tractor Days	Truck Days	Crane Days
1947-48	166,003	6.3	243,641	51,554	4,124	3,535	—
1951-52	151,903	11.0	180,280	43,668	3,561	3,622	250
1955-56	214,410	23.6	190,450	56,786	4,889	10,669	1,280

Season	Effective Days per 1000 Cunits of Wood Produced: Man Days	Horse Days	Tractor Days	Truck Days	Crane Days
1947-48	1,467	311	25	21	—
1951-52	1,261	306	25	25	1.7
1955-56	888	255	25	50	6.0
Reduction or Increase in period	−579	−56	−2	+29	+6
Reduction or Increase %	−39.5	−18	−4	+138	+600

Machinery required

In order to bring about the foregoing changes, the company purchased eight 1¼-yd. cranes, 29 tractors, 71 trucks, four motor patrol graders and 50 large truck-trailers. In addition, the company built 100 miles of all-weather roads. Present efforts are being directed to reduce or eliminate the relatively large number of horse-days still required,

since, through their use, a teamster is limited to one horsepower. In addition, other men have to be employed as barn bosses, blacksmiths, and for freighting large quantities of hay and oats.

Other advantages

Following the cutting operation foresters examine the areas to determine the amount and nature of the forest regeneration. Provided that fires can be kept from devastating the cut-over lands, it has been found that nature will in most cases provide a suitable second crop. In the cut and skid method of operation most of the seedlings and young trees are left standing after the cut. In many cases, instead of having to wait a full tree generation for a new stand to grow from seed, the advance growth left after cutting will reach merchantable size in much less time.

The construction of all-weather roads through forest areas not only reduces present logging costs but in the event of a fire men and tools can be quickly moved in to suppress it in its earliest stages.

All-weather roads, and winter roads right into the skidways in the bush, are of inestimable value for supervision purposes; superintendents and foremen can now drive in small trucks to the remote corners of the logging operations. With all-weather roads joining Iroquois Falls to all logging camps, many workers now drive to the camps in their motor cars, and although they do not commute daily, they can drive to and from their homes in a few hours.

Organic Coatings

(Continued from page 587)

and are applied at 30-35 per cent solids. As is the case with most coatings containing alcohol, drying is rapid. A typical spirit varnish based on zein will contain, in addition to zein, a rosin derivative, a plasticizer, and the solvent. A typical formulation may include 100 parts of zein, 100 parts of gum rosin, and 20 parts of polyethylene glycol (carbowax 200), together with 400 parts of proprietary ethyl alcohol. The unsaturated vegetable oil fatty acids may replace the sulfonamide plasticizer, and hydrogenated rosin may be used in the place of gum rosin if better color stability is desired. A very inexpensive coating might contain 100 parts of zein, 300 parts of gum rosin, and 800 parts of proprietary alcohol. This solution would resemble a label varnish based on Manila gum.

A typical grease prooof coating for paper or paperboard might contain 100 parts of zein, 40 parts of hydrogenated rosin, and 30 parts of polyethylene glycol (carbowax 1500) and 220 parts of proprietary ethyl alcohol.

As already indicated, zein may be coated from a dispersion of aqueous alkali. Dispersions, however, are more often prepared using an alkali metal soap of rosin, tall oil or sulfonated oil, or by the use of various synthetic detergents. A pH range of 8.5-9 is required. Thus, a typical water based formulation may include 100 parts of zein, 100 parts of gum rosin, 20 parts of oleic acid, 25 parts of 28 per cent of aqueous ammonia, and 600 parts of water. 60 parts of butyl alcohol may be added to lower the viscosity and improve film continuity. It is not necessary to add bactericides since zein is relatively stable. Such compositions may also be pigmented by ball milling with alkali resistant pigments.

A coating of good gloss is said to result from a composition containing 100 parts of zein, 50 parts of hydrogenated rosin, 15 parts of dioctyl phthalates, 20 parts of 28 per cent aqueous ammonia, and 550 parts of water.

Although zein tends to decompose on heating, it can be used in hot melt compositions because it is soluble in various resins and plasticizers which lower its melting point. Thus, these resins and placticizers are first melted after which the zein is stirred in carefully.

Frequently a so-called fusion resin is first prepared by mixing zein with resin in the presence of a fusion plasticizer such as acetanilide or acetamide. Thus, a typical fusion resin might include 40 parts of zein, 60 parts of rosin, and 5 parts of acetanilide. Such a mixture provides a melt with a ball-and-ring softening point of 115-117° C. Additional plasticizers may be added. A recommended composition for the hot melt coating of paper includes 100 parts of zein, 150 parts of hydrogenated rosin, 40 parts of sulfonamide type plasticizer, 20 parts of stearic acid, and 20 parts of urea. This mixture melts at 90-100° C.

Closed Circuit TV

(Continued from page 584)

glass dome atop each tower. The towers are linked to a central station miles away in forestry headquarters by means of microwave television relays (Figs. 5 and 6).

Each camera is driven by a radiomotor and scans a complete 360° area once every two minutes. Signals for starting, stopping or reversing the camera are transmitted from control headquarters via the microwave links. As each camera revolves, it not only views the entire scene before it as far as the horizon but picks up azimuth bearings from a scale on the plexiglass dome.

A single observer at central station can watch up to six television receivers presenting the views as seen from as many towers. Should he detect fire or smoke on any screen, he can instantly stop rotation of the camera. Remote control stop, start and reverse switches enable him to point the camera directly at the fire. By bringing cameras in other towers to bear on the same smoke, he can obtain cross-bearings from the azimuth scales and, by triangulation, pin-point the location of the fire (Fig. 7).

The fire watching towers are completely unattended and need only infrequent visiting for maintenance of the electronic equipment. The television cameras scan the horizon day and night, tirelessly and with persistence and efficiency far beyond human capability.

KTR-100 microwave provides dependable contact between the towers and central station. It transmits the television picture from tower to station. In the demonstration, a second signals from station to tower. A new KTR-100 unit was used to send control two-way communications microwave link, developed by Raytheon, can be used at considerably less cost for transmitting the control signals and for two-way communication when the tower is visited by maintenance personnel or used as a contact point by fire-fighting crews. Because a microwave relay is through-the-air wireless transmission, it can span miles of difficult terrain without the problems of wire installation and maintenance.

A possibility which presents itself to papermaking, but does not seem to have been put into practical use yet, is visual contact between the laboratory and the paper machine operator. In this age of continuous processing and automation, one of the targets is continuous analysis of the produced material. It should not be beyond the abilities of the modern paper maker to submit frequent or continuous samples of pulp or paper fibers to the laboratory in order to receive accordingly analysis reports on fiber size and distribution (Fig. 8).

What Perkin's discovery means to the paper industry

The Perkin Centennial celebrated in New York during the week of Sept. 10-15 reflects a great indebtedness of our industry to the discoverer of the first synthetic dye

PERKIN'S DISCOVERY of mauve gave chemists the first insight into the mechanism of color production and opened to us a world of brilliant, colorful surfaces that were unobtainable with the use of inorganic pigments. Chemists immediately began to build chromophore groups into organic molecules, and this gave birth to a new industry. Organic colorings, synthetic dyes, cyclic intermediates, lakes and toners now account for an appreciable portion of the total annual chemical output of more than $20 billion.

While the textile industry is the greatest consumer of dyes, using 58 per cent of the dye output valued at $181,000,000 annually, it is estimated that the paper industry uses 18 per cent of the dye output; the printing ink industry uses 14 per cent; the carbon paper industry 5 per cent; the leather finishing industry 3 per cent, and miscellaneous users use 2 per cent.

Color has become a keynote to merchandising. A wider and more effective use of color has intensified the impact of advertising as a mass selling force. From packaging to magazines, outdoor posters and color in newspapers, advertisers are making the most of color. Color is now built into the sales appeal of virtually every product, thereby becoming an increasingly important factor in industrial design.

Dyes in the paper industry

The use of color in the paper industry has experienced tremendous growth, lending a twofold impetus to the development of both the dyestuff and the paper industries. Paper has been a direct beneficiary of the sharply increased color consciousness of the American public, and colored papers have played an important part in industry and in direct contact with the consumer. The paper industry's recent rapid growth has seen increased use of colored papers in grades that run the gamut of the industry's production.

A new type of dyes, the fluorescent dyes, have come into use since World War II. While originally developed for the soap and detergent industries, major markets for these dyes are now being sought in the textile and paper industries.

The fluorescent dyes, usually stilbene derivatives, have the property of absorbing ultraviolet light and then re-emitting it as blue light. This added blue radiation has a whitening as well as an intensifying effect.

The impact of organic colorants on the printing industry is equally impressive. The availability of colorants greatly stimulated experimentation in the printing industry. In 1880 the half tone type appeared which made it possible to reproduce continuous tone pictures. Then followed color separation, which brought the four color process plates. This made possible full color reproduction in continuous tone, with simultaneous improvement in printing methods.

U. S. dye industry

The American dye industry is a key industry. It not only launched the coal tar chemicals industry and acted as a stimulant in the development of various color-consuming industries, but it also gave birth to a vast synthetic organic chemicals industry which annually turns out some $4 billion dollars worth of products.

Among the major synthetic dye manufacturers in the United States are American Cyanamid Co., Du Pont de Nemours & Co., General Aniline & Film Corp., Ciba Pharmaceutical Products Inc., Sandoz Chemical Works Inc., Arnold, Hoffman & Co., American Aniline Products, etc.

There are altogether 52 manufacturers of synthetic dyes in the United States, totaling an annual output which has ranged from 114,000,000 lbs. to 205,000,000 lbs. from 1939 to 1955. The bulk of the output, 84 per cent of the total dye output, falls roughly into four main chemical classes: the azo dyes amounting to 36 per cent of the total output; the anthraquinone vats amounting to 24 per cent; sulfur or sulfide dyes 15 per cent, and the indigoid and thioindigoid dyes amounting to 9 per cent of the total output.

The value of U. S. dye exports in 1955 amounted to $22,883,000, while the value of imported dyes during the same year was $6,200,000. The imports were largely from Germany and Switzerland, while smaller quantities were also brought in from the United Kingdom and Italy.

Vat dyes generally seem to be in growing demand because of the growing requirement for permanent colors of a more subdued tone. Their further advantage is that they can be used at temperatures ranging from luke warm to 150° F. Where the emphasis is on vivid, full shades at low cost, azo dyes are used, while direct dyes are especially suited for high-speed, continuous processing. Basic dyes have found wide acceptance in the paper industry.

The 1956 Perkin medal

The 1956 Perkin medal of the American Section of the Society of Chemical Industry was awarded to Edgar C. Britton, Director of the Edgar C. Britton Research Laboratory of Dow Chemical Co.

The 1956 award was the 50th impression of the Perkin Medal, the highest honor in American industrial chemistry. It is awarded annually for outstanding achievement in applied chemistry in the United States and commemorates the discovery of the first synthetic dye by Sir William Henry Perkin in 1856.

Dow's research men visit Paper City

- Dow's research men are introduced to a number of paper industry problems that will find their ultimate solution in the chemical laboratory
- A novel waste liquor disposal method suggested to the pulp and paper industry

A UNIQUE occurrence in the paper industry took place September 11-12, when 60 representatives of Dow Chemical Co. visited paper mills in Kalamazoo, Mich. The purpose: to acquaint Dow's technical staff with the problems of the paper industry. Dow departments involved were Research, Technical Service, Development and Sales. The mills visited were those of KVP Co., the Allied Paper Mills Div. of Thor Corp. and Sutherland Paper Co.

Dow's research men represented such laboratories as (1) E. C. Britton Research, (2) Basic Research, (3) Saran Polymerization, (4) Plastic Research, (5) Latex Production, (6) Ryden Research, (7) Physical Research, (8) Polymer Research, (9) Textile Research, (10) the Dowicide Department, (11) Biochemical Research and (12) the Strosakers Laboratory.

This visit will undoubtedly establish a mutually profitable precedent, inasmuch as the pulp and paper industry — currently the fourth largest consumer of chemicals — has an infinite number of problems, the solution of which awaits only the development and application of chemicals that will impart the desired properties to a variety of paper products.

Paper industry problems a challenge to the chemical industry

Any chemical that changes the properties of the cellulose fiber is of interest to the paper industry, said Morris Kane, director of research of KVP, while a development of major significance would be that leading to a process of bonding the cellulose fibers together chemically rather than bonding them physically as is done currently.

There are also challenging problems in the field of latex application alone. While latex has been proved to be the best paper pigments binder, W. Kirkpatrick, vice president and technical director of Allied Paper Mills, listed the following directions in which improvements in paper adhesives would be desirable:

1. The need for developing an adhesive that would impart more strength to paper products.
2. The need for an adhesive that would give better color retention.
3. The need for an adhesive that would show retention of folding quality without the loss of stiffness.
4. The need for an adhesive that would lend itself to easier and more economical handling; such as supplying latices in a dry form.
5. The development of an adhesive that will not mask the pigment properties of the fine kaolin particles which impart the best finishing characteristics to paper.

M. A. Galbraith, vice president and technical director of Sutherland Paper, posed the following problems that await solution largely through a concerted effort on the part of the chemical industry:

1. Improving the curing and drying properties of oil base printing inks.
2. Increasing the retention of organic dispersions in the paperboard sheet.
3. Developing more efficient methods for combining paperboard and chemicals.
4. Developing non-toxic fungicides and bactericides with controlled volatility.
5. Developing a low-cost chlorine releasing compound with extended reaction time.
6. An economical method of gluing polyethlene-coated paperboard.
7. A machine-coated operation to obtain a grease and moisture barrier using materials with a high blocking point.

Nuclear energy and the paper industry

Nuclear energy and the paper industry are not as differently related fields as it would seem at first glance. As pointed out by Dr. John J. Grebe, director of nuclear and basic research of Dow, the paper industry could profitably use fission products from the nuclear reactor as fuel. These fission products constitute a clean, compact, and unique potential heat source for steam and power generation in the pulp and paper industry. They also permit the decentralization of industry or the establishment of industry in areas where conventional fuels are not easily procurable.

New idea on waste disposal

Dr. Grebe further suggested that the paper industry could dispose of its waste liquor problems in a relatively simple way and, as estimated for one set of conditions, at about one tenth the cost of the waste liquor recovery systems now in use.

Dr. Grebe's method would consist in pumping the waste liquor into the ground to a suitable level of some 600-700 ft. He estimated that this could be accomplished by a 360-psi pressure pump. The method has already been used successfully for several decades by the oil production industry and has also recently been adopted by some drug manufacturing concerns. Dow Chemical has successfully tried the method on an experimental basis with a liquid that closely resembles the consistency and flow properties of waste pulp and paper mill liquor.

By the selection of the proper level, Dr. Grebe stated, there need be no danger of contaminating the underground water system. Moreover, according to Dr. Grebe, the underground disposal system provides literally an unlimited reservoir for the disposal of industry wastes.

While the ideal solution of the waste liquor problem undoubtedly lies in a complete recovery and utilization of its chemical constituents, until such methods are in operation the underground disposal method may be the answer to our inland water pollution problems and the high cost of installation of conventional liquor recovery systems.

Technical conference

At the technical conference held between the research group of Dow Chemical and the technical panel of Sutherland Paper the major topics under discussion related to problems of (1) decorative coatings, (2) functional coatings, and (3) hot melt applications.

The problems brought up in connection with decorative coatings were these of (1) using a latex-modified coating to improve ink holdout and printing properties in the top liner of board, which normally requires a high-grade pulp; (2) using latex in printing inks, and (3) a method of testing for odor.

A suggestion was made that odor-free rooms be constructed in which an organoleptic panel could screen coating materials for odor. While this suggestion was favorably received, it was pointed out that certain odors could be produced by the chemical reaction of the coating material with the printing inks or the packaged product. It would therefore be of more value to test a coating material by printing the paper, assembling the package, followed by storage at a practical range of temperatures.

In connection with improving the functional properties of paper or board, the importance of flexibility and greaseproofness was stressed. The need was expressed for a board with enough flexibility so that it could be folded through an angle of 180° without breaking or crazing, at the same time maintaining its stiffness and rigidity. The material that would improve the flexible properties of paper or board should be relatively inexpensive, be easily and completely deposited on the paper fiber from a water solution, and permit the processing of paper and board without major modifications in equipment.

The need for an inexpensive greaseproof material for packaging bakery goods was also recorded and discussed.

Discussing the use of polyethylene as a functional coating, it was pointed out that the major drawback in this connection was the lack of suitable adhesives to form polyethylene-coated cartons at present processing speeds. It was suggested that a hot melt monofilament extrusion might be the answer to this problem, although this would require major modifications in assembly, processing methods, and equipment.

The use of polyethylene-coated broke as a source of high-grade pulp was suggested. In this connection, certain problems would have to be overcome, such as (1) the difficulty of separating the polyethylene from the broke, (2) the resulting clogging of various parts of papermaking equipment, and (3) the thermoplastic effect of polyethylene on a weak paper web in the initial dryer section.

Pulp, paper and board output*

The sharp upward trend in paper and board production during the year 1955 and through the first half of 1956 has been phenomenal for a peacetime period. Total output in 1955 of approximately 30 million tons was 3.3 million tons, or 12.3 per cent, above 1954. In comparison, the average of all manufacturing industries increased 10.2 per cent. During the first six months of 1956 paper and board production of 16.1 million tons was 1.4 million tons, or 9.2 per cent, over the first half of 1955, while the average for all manufacturing industries gained 4.4 per cent.

Although the increase for all grades of paper and board during the first half of 1956 was 9.2 per cent over the same period of 1955, there was a notable variation by grade groups. Paper gained 10.2 per cent, paperboard increased 9.7 per cent, construction paper and board was up 3.7 per cent, while wet machine board declined 5.2 per cent. These major gains in both paper and paperboard production are particularly significant when compared with the more modest increase of 3.2 per cent in non-durable goods production.

At the wholesale level of our economy, total dollar sales of all goods gained 8.5 per cent in the first six months of 1956 over a year ago, while paper dollar sales were up 13 per cent. On the other hand, paper merchant inventories were up 13 per cent at the end of June against a year previous, compared with an increase of 7.6 per cent in total wholesale stocks of all goods. At the retail level, total dollar sales of all goods in the first six months of 1956 were up 3.5 per cent, while June-end inventories were up 2.6 per cent from a year ago.

All evidence points to another record-smashing production for the year 1956 in the neighborhood of 31.5 million tons, or a gain of about 5 per cent over 1955.

*From an Industry Report by W. LeRoy Neubrech

Bales are strapped in a pneumatic, seal feed strapping machine

The strapped bale is ejected from the strapping machine

Strapping of waste paper bales

THE RECENT DEVELOPMENT by Signode Steel Strapping Co. of a pneumatic, seal feed, strapping machine and the design of an inexpensive strapping station has introduced flat steel strapping as a tie for waste paper bales. Both the strapping machine and the station were adopted this year by a large Midwestern paper stock company.

For many years, this paper stock company used wire bale ties, but this method had many disadvantages.

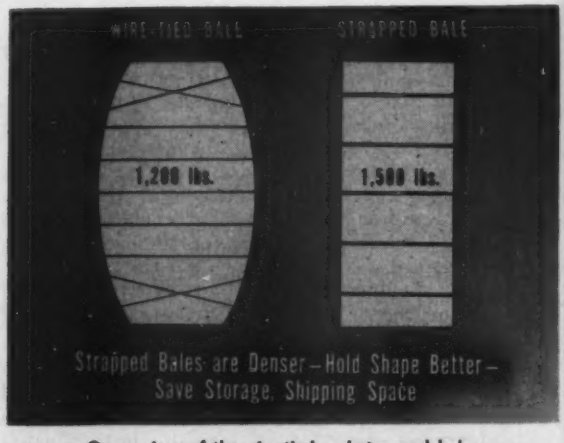
One of the difficulties of wire is its cut-to-length feature. The paper stock company used 13 gauge wire in either 13 ft. or 13½ ft. lengths. For oversized bales, an extra piece of wire had to be spliced into a tie. On undersized bales, wire was wasted.

Another difficulty of wire is that it is packaged in round bundles. The paper stock company wished to keep the area around the press clear. Thus, the wire was not located near the press.

The strapping operation

Five straps are now used per bale where 9, 11, or 13 wires had been

Strapped bales retain their shape during storage



Comparison of the wire-tied and strapped bales

used formerly. To get away from the cut-to-length difficulty of wire, five strapping dispensers are located above the slot in the platen where the strapping is threaded through. Each dispenser holds about 90 pounds of strapping, or approximately 216 bale ties each. The operator has only to reach up and pull the strapping needed from the dispenser. The pneumatic, seal-feed, strapping machine pulls at uniform, predetermined tension and automatically cuts the strapping during the sealing operation.

To eliminate the safety hazard of straps hanging in the operator's way, a magnetic bar was installed just behind the strapping dispensers. Thus, all the operator has to do is to flip the loose ends of the strapping hanging from the dispenser up against the magnetic bar to get them out of the way.

Briefly, the steps of the operation are as follows:

1. Five straps are fed through slots in the top platen during the compression cycle.
2. At the end of the compression cycle, the press doors are opened, and the back man on the press pulls the straps and feeds them through slots in the bottom platen.
3. The operator then tensions and seals the straps one at a time with the air-powered, seal feed, strapping machine.

Advantages of the strapping method

A time and materials study of the application made by the paper stock company, came up with the following report:

1. Strapping produces and maintains a denser bale resulting in a saving of storage and shipping space. It was estimated that wire-tied bales have a density of 20.8 lbs. per cubic foot, while strapped bales have a density of 26.8 lbs. per cubic foot.
2. Figuring the entire baling operation, there was a labor saving amounting to 25 per cent.
3. Since strapping is skidded for shipment, it takes only one man-hour to unload a car of it. It took four men all day to unload a car of wire.
4. With the greater speed of the application, the plant's production was increased with less operator fatigue.
5. Strapping does not stretch. The bale maintains the same volume it has when it leaves the press. Wire stretches, especially during transit. This stretching in closed carriers often bulged the sides of the carrier making unloading difficult.
6. Strapped bales maintain their shape and look neater. They do not become barrel-shaped as wire tied bales often did.

There were many other advantages, but the short of it was that the application was adopted.

Since that time, many other paper stock firms throughout the country have adopted the same or similar systems of strapping bales, and several Southern and Midwestern paper mills have gone into strapping bales.

Accelerated and normal aging of record papers

A 26-YEAR EXPERIMENT, comparing accelerated aging tests of record papers with the effects of normal aging over long periods, has recently been completed at the National Bureau of Standards.

Accelerated aging of papers is usually carried out by holding the papers at an elevated temperature for some time. Since the rates of many chemical reactions are approximately doubled with each 10-degree (Centigrade) rise in temperature, the use of higher temperatures provides, in general, a means of accelerating the aging process. However, this does not necessarily mean that the same reactions occur at higher temperatures as do at room temperatures. The correlation between accelerated and natural aging can only be determined by actual comparison of specimens aged in both ways. This requires storing specimens of the materials for several years and testing them from time to time.

To provide the data for such a comparison, the Bureau in 1928 measured the physical and chemical properties of a series of papers before and after accelerated aging at 100° C for 72 hrs. At that time additional specimens of the papers were stored for normal aging and future testing. After four years and again after eight years of normal aging, the stored specimens were tested for folding endurance; tensile strength; water-soluble acidity; pH; alpha- beta-, and gamma- cellulose; and copper number. The chemical tests were repeated after 22 years and the physical tests after 26 years.

Results of aging tests

Statistical analysis of data on folding endurance gave some indication of the relationship between natural aging and accelerated aging. No quantitative conclusions could be drawn, as the manufacture and testing of paper had not progressed far enough in the late twenties to permit the proper control of variables in the selection of samples. However, logarithmic plots of natural and accelerated aging versus time indicated reasonable good correlation.

The chemical test data showed fair correlation between normal aging and accelerated aging of all papers except the best rag papers. Changes in the latter were almost negligible after 22 years of normal aging, whereas small but definite changes had occurred after accelerated aging.

The tensile strength of the papers decreased very little with either accelerated or normal aging. However, such changes as were observed did appear to show a correlation between the two types of aging. As the folding endurance decreased sharply for all types of papers, it is apparent that much greater change occurs in the fatigue characteristics of the papers than in the strength.

Any consideration of the permanence of paper must take into account both the stability of the cellulose and the structural stability, or stability of sheet formation. Cellulose permanence is independent of the sheet structure but paper permanence depends both on cellulose stability and on the permanence of the sheet formation. Chemical tests are a measure of cellulose permanence while physical tests show the structural stability.

The chemical test data on the rag papers indicate very little deterioration in 22 years, but the folding endurance decreased, on the average, to less than half of the original value. It thus appears that structural stability of the paper sheet decreases much more rapidly with aging than does the stability of the cellulose molecule.

How to establish a year-end bonus plan

J. E. BEDFORD*

▶ Year-end bonus plans are being adopted by more and more paper mills. Here is a plan that has many advantages and will save money taxwise.

PAPER MILL MANAGEMENT, using a year-end bonus as a part of its compensation plan for key personnel, finds it has many advantages—and some drawbacks. A bonus plan will save tax dollars, increase employee loyalty, reduce absenteeism, cost some money, and take time to compute each year.

Increases executive loyalty

Paper mill executives who are compensated in part by a bonus plan develop a more loyal spirit. They have a stronger feeling of belonging to the profit team of the paper mill. The year-end bonus makes these people feel they were in part responsible for the profits of the mill. They will put forth extra effort to keep profits up and the bonus payments coming in each year in the future.

In addition to this type of loyalty, a year-end bonus plan will improve the firm's prestige in the area and in the industry. There will be no shortage of applicants for any key spots that do develop in the organization.

Reduce income taxes

Paper mill management realizes an income tax saving when it has a year-end bonus plan. Naturally, the income tax payments are not reduced by the amount of the bonus. But, the taxable income is reduced dollar-for-dollar by the amount of the year-end bonus payments.

Based on the corporate income tax rate, bonus payments cost (out-of-pocket expenses) 48c for every dollar of bonus paid to the key men . . . . . an inexpensive way to improve morale and strengthen loyalty of an executive team.

Base bonus on merit

Santa Claus is fine on Christmas, but most people do not expect him every day of the year. And, if the year-end bonus is paid as a gift, it will not accomplish as much as possible in building loyalty and increasing production or reducing costs. Then, too, a gift is not a tax-deduction, like a bonus based on merit is according to the Internal Revenue Bureau.

As a general rule, a year-end bonus is appreciated more if it is awarded on the basis of merit. The key employee will work harder and be more loyal if he feels he earns the year-end bonus.

Some paper mill managements base the year-end bonus payments on the basis of results. This method has much to recommend it from an executive development standpoint and taxwise. However, the practical limitations of establishing exact result figures for various people on the executive level is obvious. There is no yardstick to measure results of a top management team on an individual basis.

Another plan is to base the bonus on the length of service for the individual involved. For instance, if the total time of five executive level employees totals 25 years service, the bonus would be paid on the basis of 4 per cent of the total bonus for each year of employment. If total employment time is 200 years, the share of the bonus would be one-half of one per cent per year per man. This system has much to recommend it. It puts extra emphasis on executive loyalty and tends to reduce labor turnover in the organization.

Still another plan of allocating the year-end bonus to the management team is to base it on the annual income of all people involved. The total payroll of the group is divided into each man's annual earnings. This provides a percentage figure to be used in dividing the year-end bonus for each member of the management team.

Other factors may be worked into the allocation of the year-end bonus plan. For instance, it may be derived to include a provision for encouraging new executives, to give extra bonus payments for outstanding accomplishments of certain individuals, or to reward loyal men with extra payments.

Avoid tax pitfalls

Taxwise there are two things to keep in mind about the year-end bonus plan:

1. It must be "reasonable."
2. It must not be a disguised dividend.

There is no exact mathematical formula for computing the "reasonable" requirement of the year-end bonus. According to the Internal Revenue Bureau, a bonus is "reasonable" if it is what would be paid under similar circumstances by similar firms for similar services.

As a general rule, the Internal Revenue Bureau interprets "reasonableness" by the skill or training required to perform the job, the amount of responsibility demanded on the job, the profit earned as a result of the work, the future prospects of the individual and the management of the paper mill.

Another area often investigated by the Internal Revenue Bureau on year-end bonus payments is to minor children. When the year-end bonus payment to a minor child is out of line with the responsibility, skill and profit contribution of the child, the amount of the year-end bonus may be disallowed. This, of course, will increase income taxes.

When a bonus paid to an employee bears a close relationship to his holdings in the company, the Internal Revenue Bureau may disallow it on the grounds that it is a "disguised dividend." Even though there is no relationship between the holdings of the stockholding employee and his year-end bonus, part of the payment may be disallowed.

To be on the safe side, year-end bonus payments should be based on: skill, training, responsibility, working conditions, profit contribution, and future prospects of the management men and the paper mill's business.

Pay bonus with showmanship

This, of course, does not mean that a brass band should be on hand when key men receive their year-end bonus payments. But, a little quiet showmanship will make them feel that they are actually getting some-

*Professor of management, Armstrong College

thing over and above their regular salary as a bonus.

One organization, for instance, gives its year-end bonus payments in the form of certified checks. This makes the transaction seem more legal to the men and makes the payment more impressive.

Another firm always passes out its bonus checks in private. This provides an opportunity for the top executive to add a few personal words of "thanks" to the cash bonus he gives to his key employee. And, it tends to keep the amount of the bonus on a more confidential basis in the organization.

Contrast these ideas with a bonus that is included in the regular salary check. The man knows there is a bonus, but it takes a little figuring to arrive at the amount that is extra. And, with income tax and other deductions, the amount of the year-end bonus is not as impressive as when it is paid in a separate check.

Year-end bonus plans do not cost as much as might be expected. And, when the long-term benefits of better employee relations are considered, the expense is changed to an investment in the future success of the paper mill.

Estimated time of passage in rotary kilns

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Head Shift Chemist
Hollingsworth & Whitney Div.
Scott Paper Co., Mobile, Ala.

THE RETENTION TIME of lime passing through a rotary kiln can be determined by substituting into the equation below (1):

$$R = \frac{(F)\ (L)}{(S)\ (N)\ (D)}(K) = \frac{11.2\ L}{(S)\ (N)\ (D)}$$

where:

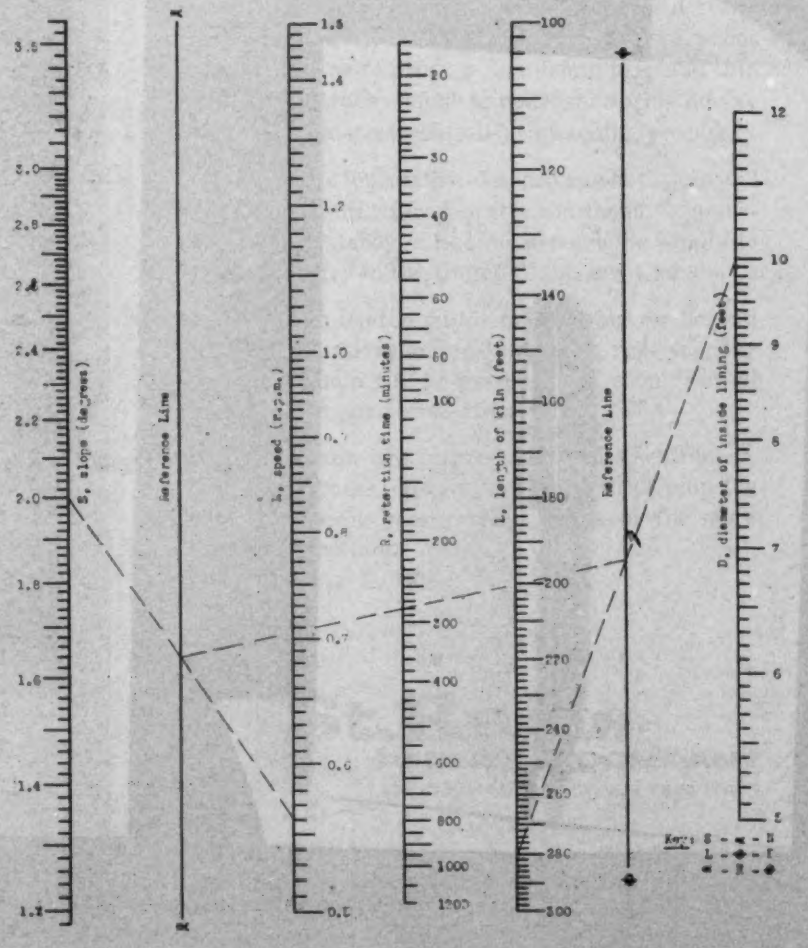
- R = retention time (minutes)
- F = factor determined by angle of repose; 11.2 for lime-sludge kiln
- L = length (feet)
- S = slope (degrees)
- N = speed (r.p.m.)
- D = diameter of inside lining (feet)
- K = factor determined by restrictions in kiln: factor of 1 for usual kiln with no dam rings, enlarged zones or other restrictions.

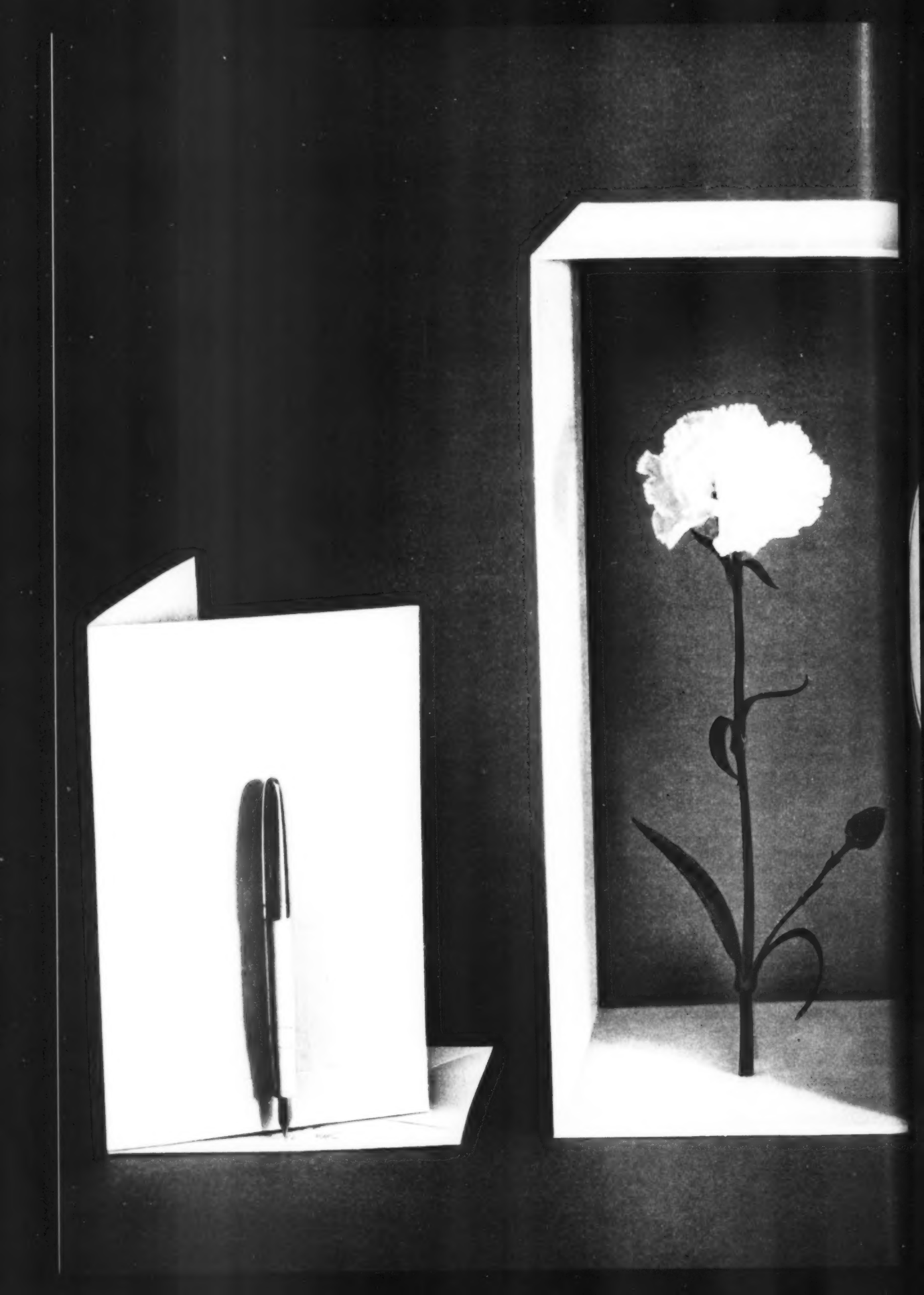
The equation can be solved accurately and conveniently through use of the accompanying line coordinate chart, which was constructed by principles previously described (2) and based on the angle of repose being equal to 11.2 and (K) equaling 1.

Typical example

What is the retention time of lime passing through a kiln whose slope is 2.0 degrees, rotating at 0.56 r.p.m., length is 280 ft. and with inside lining diameter of 10 ft? Follow the dashed lines, connect 2.0 on the S scale with 0.56 on the N scale, connect 280 on the L scale with 10 on the D scale, connect the inter-sections on the reference lines α and θ and note that it intersects the R scale at 280 minutes.

Literature Cited:
(1) "Pulp & Paper Manufacture", Volume 1, McGraw-Hill, page 649
(2) "Empirical Equations and Nomography" by D. S. Davis, McGraw-Hill, Chap. V





The whitest white you've ever seen

In fine wedding invitations . . . in special packaging and in facial tissues . . . in paper and paper products where special qualities are required . . . a new whiteness will shine. And with this whiteness will go opacity and strength beyond the ordinary. The source of these qualities will be Alberta Hi-Brite, a wood pulp that is unique to this continent.

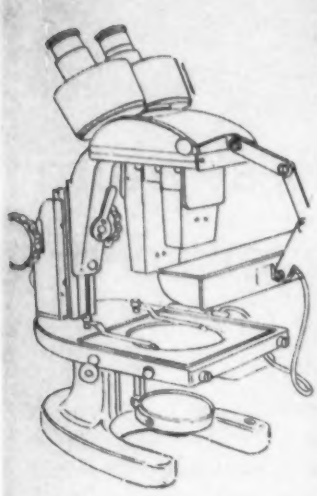
Hinton, province of Alberta, Canada, was chosen as a site to manufacture this pulp. Surrounding the mill are millions of acres of spruce and lodgepole pine. These two woods combine to produce fine fibers, long and thin and strong enough to resist shattering during the six-stage continuous bleaching process.

This top quality bleached sulphate pulp will be manufactured on this continent . . . assuring a steady, adequate, dependable supply to industry in the United States and Canada.

The Hinton mill is progressing far beyond expectations and in January of next year the first pulp will be available . . . soon to swell to a volume of 430 tons a day.

If you are interested in this whiteness, brightness, opacity and strength of pulp for producing your product, write us for more information.

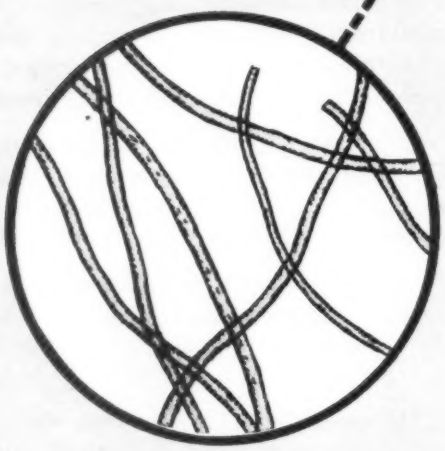
St.Regis
PAPER COMPANY
150 EAST 42ND STREET, NEW YORK 17, N. Y.



Do Treatments IMPROVE Felt Performance?

When special conditions existing on paper machines cause unusual or accelerated felt deterioration, it is possible to reduce the degradation or eliminate it entirely. In most instances, special treatments can increase the life of woolen and synthetic felts. Treatments, like felts, must be soundly engineered, however. The specified advantages of any treatment are not automatically effective in every case.

Differences in machines and the conditions under which they operate, variations in temperature, water, the chemical content of the pulp, and many more factors cause a wide variance between conditions which may appear similar on the surface. A careful technical analysis of the conditions involved in each individual case of felt deterioration is necessary, before a treatment can be correctly recommended. Lockport Felt Sales and Technical Service Representatives are fully qualified to make such case studies in cooperation with paper mill personnel. Their recommendation, backed by Tenax Research and Engineering, is available without obligation of any kind.



Enlarged View of TREATED Felt Fibers. Subjected to long-continued washing in water, plus biological degradation and extreme abrasive wear tests, these woolen felt fibers retain their unimpaired individual strength and configuration, thus insuring continuing performance as designed.

Enlarged View of UNTREATED Felt Fibers. Having undergone the same series of tests as the treated fibers, the untreated wool fibers lose their cuticle, or outer skin, and the individual fibrils become separated. The result is a virtual destruction of tensile strength and resilience, with an increased tendency of the felt to mat and fill up.

TENAX FELTS

LOCKPORT FELT COMPANY INC.

Serving the Paper Makers Since 1891

NEWFANE, NEW YORK STARKVILLE, MISSISSIPPI

CURRENT COMMENTS

Forecasters Fooled . . . Congressional failures . . . and a boiling pot

Every month sees a stereotyped statement from official sources to the effect that new records of production of paper and paperboard have been established for that month and for the year to date. All the most optimistic forecasts at the first of the year as to probable 1956 output have been dwarfed by actual production. In the first six months production was up 9 per cent over the first half of 1955, a total of 16,071,000 tons as compared with 14,720,000 tons. Output of pulp is 10 per cent above last year, and consumption of pulp as shown by pulp industry figures is up 9 per cent over the first half of 1955.

Some paper manufacturers have been taking violent exception to suggestions in some quarters that the industry is ever-expanding. One such comment was that forecasters should confine their pessimism to their own grades. The optimists say that the country's prosperity is such that consumption will run into undreamed of figures.

All of this takes money and lots of it. A compilation by Wall Street agencies indicates that the first half of the year saw bonds and similar issues placed by underwriters at something over $125,000,000 for paper and pulp mills. This does not take into account the issuance of new securities at varying prices. For instance, St. Regis issued over ½ a million shares, some of which went in exchange for stock in newly acquired companies. Weyerhaeuser Timber issued 116,000 shares, Container Corp. more than 115,000 shares, Kimberly-Clark 18,000 shares, and these are only part of the details in the expansion of the industry.

Disappointments

The closing months of the Eighty-Fourth Congress showed a failure to act on two measures of specific interest to the paper industry. The bill to place certain writing papers on the duty-free list died in committee. The bill to change the tariff classification of hardboard from processed paperboard to the higher rate for miscellaneous manufactures of wood was turned down, but the Tariff Commission was instructed to investigate the situation and report to the next session of Congress. One bill was passed and signed to provide a duty rate change for coated paper used in the production of magazines for export. The bill eases the technical requirements under which coated paper can be used for publication of magazines or other printed matter for export. Originally, the law required that imported paper could be relieved of duty upon exportation of the magazines for which it was produced. The new ruling relieves the companies of the technical requirement and allows a drawback of the duty paid on any paper used in the exported magazines, whether or not it is the actual imported product. This obviates the need for press stoppage for substitution of imported paper to be used on magazines for export. The change means little in volume of imports.

A shift in attitude

The political pot is boiling and running over. It will be difficult to find any reader who has fully digested the platforms of the two parties. While the two platforms in general reflect the historic views of the two major political groups, there was a significant shift in the attitude of the two parties toward tariff protection. The Republican platform is hardly different in spirit from the original Democratic doctrine of low tariff rates, or even quasi-free trade. The Democratic platform, however, while adhering to the policy of reciprocal trade agreements, is sharply critical of the Republican administration for its failure to utilize such provisions as "escape clauses." In fact, there is an intra-party split in each party. Southern Democrats, stirred up by threats of the southern textile industry, are being aligned with the northern old-fashioned Republican protectionists. On the Republican side, the northern Republicans of the more liberal block are lining up with the southern old-line free-trade Democrats. The two platforms are almost a complete reversal of the tariff planks of by-gone campaigns.

*Current Comments are contributed, and the opinions expressed do not necessarily reflect the views of the publisher.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	September 10, 1956	August 1,1956
A.P.W.	4⅛	4¼
Celotex	42⅛	41⅞
Same Pref.	*18⅝-18⅞	19⅛
Certain-Teed Products(New)	11	35½
Champion P & F	38	42½
Same Pref.	*100-103	*102¼-104½
Chesapeake Corp.	*38¼-38¾	40⅓
Container Corp.	88	91¼
Same Pref.	*97½-99½	*100½-102
Crown Zellerbach	59¼	64¾
Same Pref.	*100½-102	*102½-103
Dixie Cup	59½	55¾
Eastern Corp.	*31-31¾	34½
Federal Paper Board	31⅜	34½
Fibre Paperboard	34⅜	37
Same Pref.	*111-116	*114-124
Robert Gair	35	38⅜
Same Pref.	115	122
Great Northern	94	103
Hammermill	35⅞	37¼
International	125½	138⅓
Same Pref.	*99-100	*99¼-100
Kimberly-Clark	49⅞	55⅛
McAndrews & Forbes	*41½-42½	*42¼-43¾
Marathon	35½	41¾
Masonite	43	46¾
Mead Corp.	35	40
Same Pref.	101	101
Same Sec. Pref.	*78-80	88-91
Minnesota & Ontario	35¼	38½
National Container	34	34⅜
Same Pref.	59⅞	61
Oxford Paper	45¼	49⅝
Same Pref.	100¾	*100½-101½
Rayonier	37½	41½
Riegel	38⅛	38⅛
Scott Paper	67½	73¼
Same $3.40 Pref.	*93½-95	*94-96
Same $4.00 Pref.	*100-101½	*99½-101½
St. Regis Paper	53⅜	58¼
Same Pref.	101	99¼
Sutherland Paper	42	*46½-48
Union Bag-Camp	37	42
United Board	23⅛	*24⅝-25
United Wallpaper	8⅛	—
Same Pref.	*15½-17	24¼
U. S. Gypsum	69¼	75¾
Same Pref.	166½	*160-172
West Va. P. & P.	54	60
Same Pref.	105	105¾

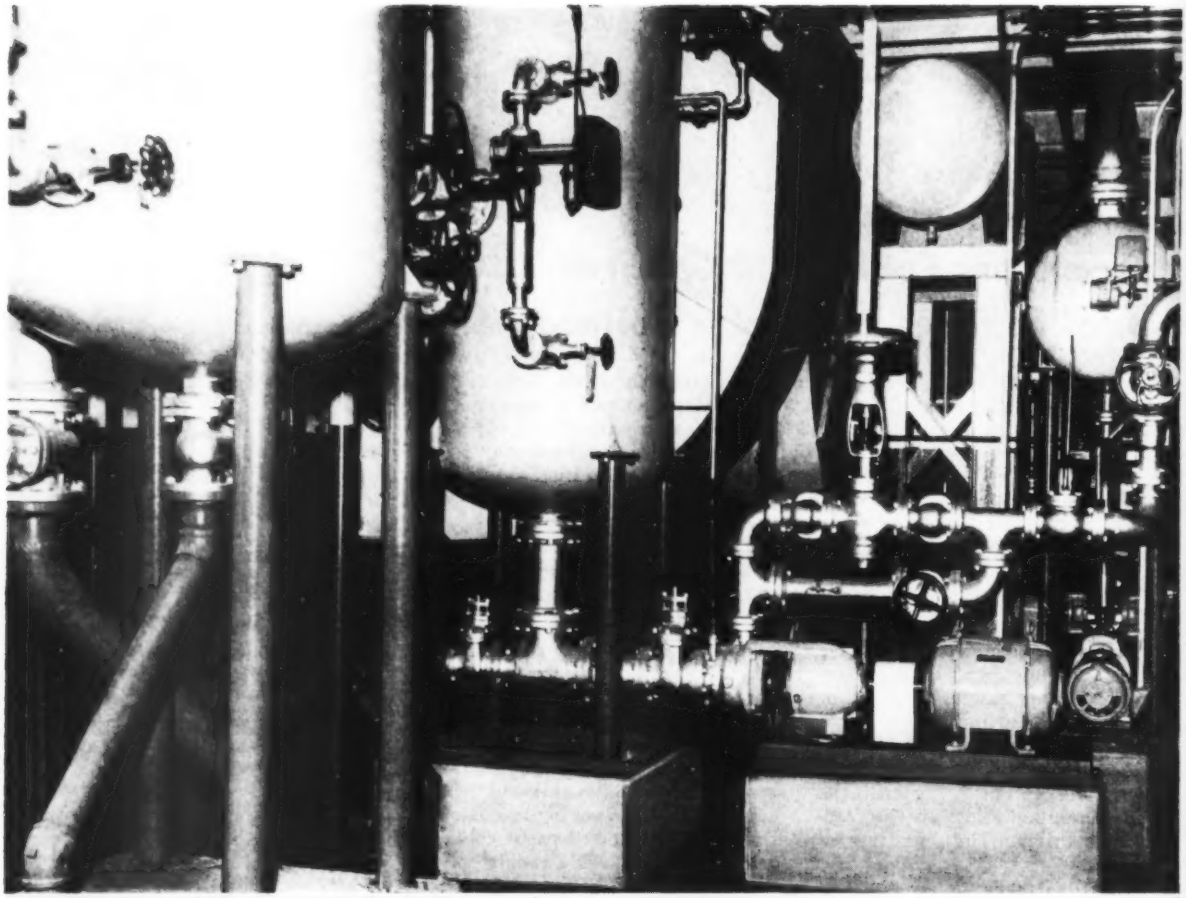
New York Stock Exchange — Bonds

A.P.W. 5%	—	—
Champion P. & F. Co. 3¼%	—	—
Mead Corp. 3%	—	—

American Stock Exchange — Stocks

American Writing	24⅛	21
Brown Company	20¼	21⅞
Puget Sound	19⅛	21¾

*Closing Bid and Asked Prices



Typical large Fulton system on big, fast Fourdrinier in Maine.

KNOW ANY BETTER WAY

to improve your operation?

Fulton dryer drainage systems are going onto old machines and small machines as well as onto today's giants—and the reasons are plain.

Automatic control of the drying operation under all conditions and at all speeds.

Properly graduated temperatures from the wet end dryers clear on through the section.

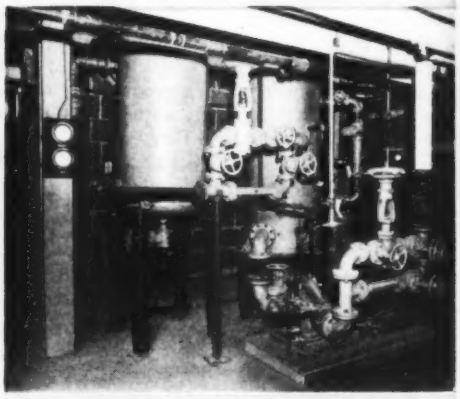
Uniform drying clear across regardless of machine width or speeds.

Less broke. Less shrinkage. Less cockling or curling.

Most important of all, Fulton systems remove slow drying bottlenecks and pave the way for faster operations and higher production schedules.

Because the smaller the machine, the more simple the system, Fulton equipment for older and smaller machines involves only a modest investment—and that soon amortized.

Have us explain more fully.



Typical two-stage condensate return unit with automatic controls.

ROSS MIDWEST FULTON CORPORATION

DAYTON, OHIO

Subsidiary of J. O. Ross Engineering Corporation

NEWS of the INDUSTRY

APPA Tabulates 1956-58 Expansion

The past year has seen many announcements as to plans for increased capacity by pulp and paper mills. In an effort to summarize these proposed developments, the American Paper & Pulp Association has prepared the accompanying tabulation.

In preparing this information, data were obtained from reports submitted by companies in the most recent APPA survey of capacity (1955), public announcements and from information made available by machine manufacturers. E. W. Tinker, APPA executive secretary, stresses that all of the reported plans for expansion had not been verified as to daily capacity and grades to be produced. Further, company plans as to the grades to be produced are uncertain and subject to change.

The data contained in the table are on the basis of a 310-day year, although it is recognized that the majority of mills are currently operating more than six days.

And in developing the data for individual grades, only partial information was available concerning increases to derive from rebuilding or speeding up existing equipment. Evidence exists that the annual increment resulting from these means will amount to 470,000 tons in 1956, and it seems reasonable to assume that 400,000 tons might accrue from rebuilding and speed-ups in 1957 and 1958, respectively. These amounts are materially more than was reported in the APPA 1955 survey. When due allowance is made for the differences, the totals are increased by 300,000, 230,000 and 340,000 tons for the years 1956, 1957 and 1958, respectively.

Finally, no effort has been made to take into consideration the approximately 1,000,000 tons of capacity represented by plans in the formative stage for 1958 and 1959.

Paper and Board Estimated Capacity Expansion through 1958 by Major Grades

(based on 310 days)

	Capacity 1955	Expansion 1956-1958	% Change
	(tons)		
PAPER			
Newsprint	1,389,110	693,780	49.9
Book and Groundwood	3,862,910	297,370	7.7
Fine	1,431,000	181,500	12.7
Coarse	3,571,820	343,480	9.6
Tissue	1,852,560	232,340	12.5
Absorbent and Special Industrial	671,460	8,680	1.3
Building	1,501,950	142,910	9.5
Total Paper	14,280,810	1,900,060	13.3
BOARD			
Container (bending and non-bending)	13,248,160	1,956,720*	14.8
Cardboard and Special Stock	1,194,740	98,580	8.3
Wet Machine	199,950	—	0.0
Building	1,846,670	376,650	20.4
Total Board	16,489,520	2,431,950	14.7
TOTAL PAPER AND BOARD	30,770,330	4,332,010	14.1

*Includes 476,000 tons of food board.

Note: The above tabulation relates only to planned new capacity that, on the basis of information available, it was believed feasible to assign to one of the major grades. In addition, there are approximately 900,000 tons estimated to be derived from rebuilding and speed-ups and about 1,000,000 tons from projects not as yet finalized, which it was not practical to assign.

Procter & Gamble to Purchase Charmin Paper

Procter & Gamble Co. is planning to broaden its products line by acquiring Charmin Paper Mills Inc. of Green Bay, Wis. Although no contract had as yet been signed, negotiations were practically complete late in September.

Charmin shareholders are to be asked to approve the transaction (an exchange of stock) at a special meeting.

P & G has produced chemical dissolving pulp from cotton linters at Memphis, Tenn., (Buckeye Cotton Oil Co.) for more than 35 years and also has a mill at Foley, Fla., (Buckeye Cellulose Corp.) for the production of dissolving pulp and paper grade pulp from wood.

Charmin will continue under the present management as a P & G subsidiary. In Green Bay the firm operates sulfite pulp facilities, a complete papermaking and converting mill and research laboratories. Charmin also has a groundwood mill at West DePere, Wis., and is renovating the recently purchased groundwood pulp and paper mill of Paper Corp. of America in Cheboygan, Mich.

In the year ended April 30 Charmin reported a net income of $1,472,077 on net sales of $22,751,062. While in the year ended June 30 P & G had a net income of $59,326,471 on sales of $1,038,290,374.

Mill Men Take Issue with Zellerbach Outlook

A recent prediction and warning voiced by James D. Zellerbach has been carefully weighed by a group of pulp and paper mill executives in Montreal. Zellerbach is president of Crown Zellerbach Corp.

The Prediction: Kraft pulp and board are likely to be in over production next year and newsprint in two years.

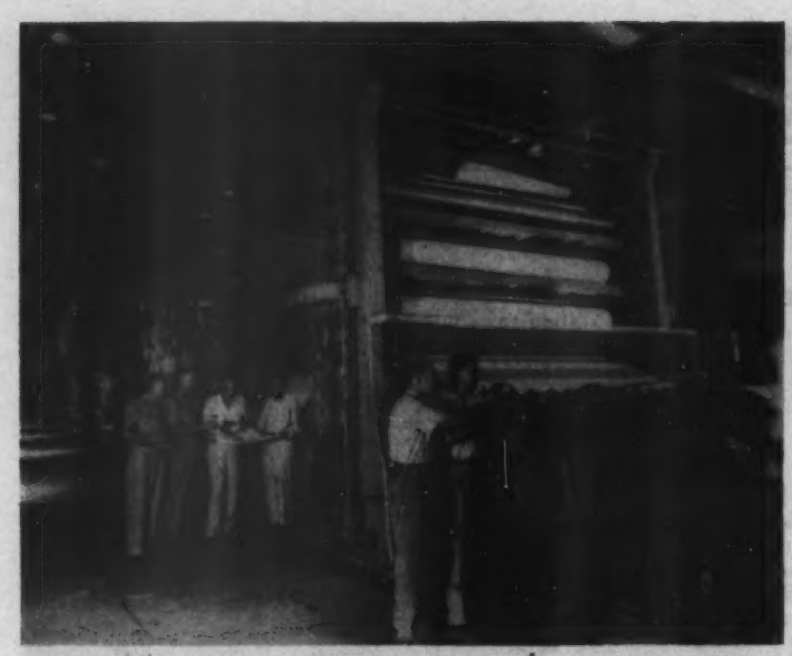
The Warning: A price war could develop unless the industry is "wise about it."

The initial reaction reported by the Montreal executives found considerable merit in "part of Zellerbach's argument." However, they were unable to see the current situation shaping up in such a way as to spell disaster or even major difficulty for the industry.

One newsprint mill official declared flatly that while there might be some overcapacity by 1958, he did not believe that it would be of sufficient magnitude to result in a price war. He added that a great deal depended on what newsprint exports to soft currency countries would be in 1958. He predicted that these markets are likely to open up.

A Timely Warning

Another official said that the prediction—although not to be construed as the voice of impending doom—could be taken as a timely warning. Expansion plans, he pointed out, if not already imple-



NO. 3 PAPER MACHINE recently placed in operation by Beckett Paper Co. of Hamilton, Ohio. Part new, part reconditioned, the 143-in. fourdrinier is rated to produce 75 daily tons of high-grade lithographic papers. The 800-fpm unit has a Valley inlet headbox; 39 dryers 4 ft. in diameter, including seven felt dryers in the first dryer section; standard size press and tub; ten 4-ft. diameter dryers in the second dryer section, and one calender stack. The machine is equipped with an Accu-Ray basis weight control gauge produced by Industrial Nucleonics. Installation of automatic pH control equipment is planned

mented could be quickly shelved if conditions warranted.

Still another view was that the industry, as the result of numerous speed-ups, is currently in the position of operating much of its machinery at greater than optimum speeds. Overproduction could be offset by a reduction in speed, which one official concluded "wouldn't do any harm."

Champion P&F to Install New Machine at Carolina Div.

A long-range over-all expansion program undertaken by the Champion Paper & Fibre Co. will include the installation of a new fourdrinier at the Carolina Div. in Canton, N.C.

The 220-in. unit is expected to be in operation sometime in 1959 at speeds of up to 2000 fpm. It will be one of the world's largest in the production of a wide variety of white business papers. No major contracts in the project had been let.

A two-story building with 124,000 sq. ft. of floor space will be built at Canton to house the machine, while an attached four-story structure of 50,000 sq. ft. will house the stock preparation equipment.

Planned revisions and equipment installations at Carolina Div. pulp production departments will result in a daily increase of 150 tons of pulp, boosting the total output to 1100 tons per day. Paper and paperboard tonnage is expected to jump from 700 to 1050 daily tons when the new machine is in operation.

Other new Canton installations will include an additional barking drum, two digesters and extensions to the causticizing system, and added washing, screening and bleaching equipment. One unit of the new chlorine dioxide bleaching system is now in production, and the installation of a second unit is in progress.

CZ to Build in Bogalusa; May Buy Louisiana Site

The expanding national market has prompted Crown Zellerbach Corp. through its Gaylord Container Corp. Div. to plan the construction of a $4,000,000 multiwall bag plant at Bogalusa, La. The Louisiana facility will go far in meeting the demand for CZ bags in the South, Midwest and East. (A $2,500,000 plant at Antioch, Cal., was scheduled for operation in September.)

The Bogalusa plant will be of one-story design 350 ft. wide by 600 ft. long. Exterior walls will be of precast concrete panels. Construction will begin in December. Start-up is set for the fall of 1957. The plant will run bag-tubing machines and such auxiliary equipment as bottomers, presses, sewing and paste-making machines.

May Buy Plant Site

Crown Zellerbach has filed an option to buy about 1900 acres near West Feliciana, La. The company, according to reports, has called the tract one of several possible sites for a new paper mill.

Crown Zellerbach has announced long-range plans for the expansion of its Lower Mississippi River operations. The West Feliciana tract is about 20 miles north of Baton Rouge on the Mississippi.

Hammermill Buys 800 Acres

The Pennsylvania Department of Commerce has reported that Hammermill Paper Co. has contracted to purchase an 800-acre site in western Pennsylvania for a proposed multimillion dollar paper and/or pulp mill.

According to D. S. Leslie, president of Hammermill, acquisition of the site is still in the preliminary stages. The tract, located near Franklin on the Allegheny River, is owned by the Society of Missionaries of Africa.

Research and Development Program Launched by Kraft Paper Association

H. S. Daniels, president of the Kraft Paper Association, has announced a new program aimed at keeping kraft paper production and use moving upward. This steady trend has brought kraft use from 1,300,000 tons annually in 1939 to 2,700,000 tons in 1955. The program will be on an industry-wide basis and will be directed towards the acceptance of kraft paper in new markets of industry.

The Research and Development committee, made up of marketing research and publicity specialists from member companies, will be headed by L. J. Doyle, vice president of Union Bag & Paper Corp. It will coordinate its efforts with the industry's own converting members and the outside converters who use the major share of kraft paper produced by the mills.

The kraft product itself is undergoing changes at the mill level, where new additives, new laminates and polyethylene coatings are giving it qualities which should mean new uses.

ABOVE—Hydrapulper recently installed at Johnsonburg, showing operating control and instrument board. Instrumentation is by Minneapolis-Honeywell

RIGHT—Hydrapulper at the New York & Pennsylvania mill is fed by a conveyor belt. Broke cages are power-operated from the console to the right

New York & Penn Installs Hydrapulper

Continuing the modernization of its stock preparation system at Johnsonburg, Pa., New York & Pennsylvania Co. has put a 20-ft. hydrapulper into operation.

Manufactured by the Shartle Bros. Machine Div. of the Black-Clawson Co., the unit replaces three hand-charged repulpers. The latter will be retained for emergency use.

Primary purpose of the hydrapulper is to repulp broke. However, it can be used for repulping dry pulp from a storage warehouse in the event that either the soda or sulfite mills are temporarily shut down.

The complete hydrapulper unit includes a 15,500-gal. rubber-lined dilution water tank, an operating console and a scale for weighing charges. It is fed by a 70-ft. belt conveyor, onto which broke or dry pulp from storage is dumped from either of two power-operated dumping cages.

The stock preparation and control system at Johnsonburg is patterned after a similar system at the firm's Lock Haven mill. Total cost of the project, which began four years ago, was more than $1,000,000.

Size Press for Lock Haven

Work has begun on the installation of size press equipment for No. 8 machine at the Lock Haven mill. Completion was expected early in October.

With the size press, the machine — a Beloit Iron Works fourdrinier trimming 138 in. — will be capable of turning out 50 tons per day of offset or other surface-sized grades.

In addition, the installation includes a new reverse second press and new dryer sections. The present third press is to be eliminated to make room for four new felt dryers. The completed dryer section will contain 27 units of 4-ft. diameter. Twenty of these will be ahead of the size press, seven following it. The size press, second press and new dryer sections are being supplied by Beloit.

Recent Expansions in the Industry

Marathon Corp.
has arranged to borrow $95,000,000 that will be used for (1) normal expansion and (2) to repay previous loans. Interest on the borrowings from the several eastern and mid-western banking houses involved will run from 3⅛ to 4¼ per cent. Of the total, $55,000,000 will be devoted to Marathon's recently announced four-year expansion program.

Hammermill Paper Co.
of Erie, Pa., which recently reported plans for a multimillion dollar expansion program, is considering doubling the extent of the project.

MacMillan & Bloedel Ltd.
will build in British Columbia a grocery bag factory expected to cost about $500,000. This converting unit will provide an outlet for part of the production of a new kraft paper and board machine soon to be in operation at the Alberni Pulp & Paper Div. The machine is to have a daily capacity of 180 tons.

Container Corp. of America
has awarded the contract for construction of a folding carton plant at Renton, Wash. Completion of the plant, which will permit expansion of corrugated shipping container production at Seattle, is expected early next year.

Spruce Falls Power & Paper Co. Ltd.
of Kapuskasing, Ont., plans to boost its newsprint capacity from 242,700 to 281,700 tons by 1959. Two of four machines will be speeded up in the project.

Elk Falls Co. Ltd.,
a subsidiary of Crown Zellerbach Canada Ltd., recently put into operation its new $15,000,000 kraft pulp mill at Campbell River, B. C. The initial daily capacity is 400 tons of unbleached kraft pulp, which will be raised to 500 tons of both bleached

CONTRACT-SIGNING ceremonies herald the official agreement whereby Beloit Iron Works will construct a paper machine for Nekoosa-Edwards Paper Co. In the back row (l to r) are: H. C. Moore, Beloit president; C. H. Reese, Nekoosa-Edwards vice president for manufacturing, and C. E. Macklem, Beloit vice president. Seated are: E. H. Neese, Beloit board chairman, and John E. Alexander, president and general manager of Nekoosa-Edwards

News of the Industry . . .

and unbleached when a $7,500,000 kraft and newsprint machine begins production in 1957.

Charmin Paper Mills Inc.
of Green Bay, Wis., has encountered delays in rehabilitating its newly acquired mill in Cheboygan, Mich., which was scheduled for operation early in 1957. Because of the late delivery of paper machine equipment, the start-up may be pushed back six to eight months. Renovation and remodeling of the former Paper Corp. of America plant continue uninterrupted.

Franconia Paper Corp.
of Lincoln, N. H., plans the start-up of its $500,000 steam plant addition in December.

Federal Paper Board Co. Inc.
plans to build a 100,000-sq. ft. folding carton plant near Washington, Pa. Cost and expected date of completion have not been disclosed.

Bergstrom Paper Co.
of Neenah, Wis., has announced plans to acquire Whale Safety Paper Co. of Waupaca through an exchange of stock. Stockholders were to vote on the proposal in September. Whale Safety Paper was established in 1946 and manufactures wet and dry sensitized papers.

Scott Paper Co.
has purchased a 41-acre tract in south Philadelphia for construction of a new headquarters building and "possibly" a research laboratory. Purchase price for the land, acquired from the City of Philadelphia, was $207,500.

National Container Corp.
has reported that its merger with Owens-Illinois Glass Co. has been approved by the stockholders of both firms.

The Flintkote Co.
will construct an Insulrock-producing plant at North Judson, Ind. It will increase by more than 50 per cent production of the chemically-treated fibers completely coated with portland cement and bonded under pressure. (Flintkote acquired Insulrock in February 1956.)

Bowater Power Co.,
a subsidiary of Bowater's Newfoundland Pulp & Paper Mills Ltd., will construct a power plant at Corner Brook, Nflnd. Work on the 9200-kw facility is being done by Shawinigan Engineering.

International Paper Co.
at Pine Bluff, Ark., has ordered two steam turbine-generator units with a total capacity of 60,000 kw from General Electric Co. The units will be installed in the paper firm's new $57,000,000 newsprint and bleached kraft board mill.

Bergstrom Paper Co.
of Neenah, Wis., has started the construction of headquarters office buildings adjacent to the new finishing plant. The structures will provide approximately 8000 sq. ft. of working space and cost an estimated $200,000.

The Colombian Government
has awarded contracts for the construction of three paper mills at a total cost of about $30,000,000 to Parsons & Whittemore-Lyddon of New York, N. Y. The action will enable Colombia to become completely independent of newsprint and white paper imports. Machinery and equipment will be supplied by the Black-Clawson Co.

Container Corp. of America
will build a $1,500,000 plant and at the same time expand present operations in Muskogee, Okla. According to the firm, the new operation will boast the "largest corrugating machine in the Southwest."

Crown Zellerbach Corp.
was to begin construction this summer of a kraft bleach plant at Camas, Wash. The facility, designed for a 300-ton daily capacity, will double present facilities. Cost will be about $2,700,000.

Bowater Corp. of North America, Ltd.
has announced that an offer to purchase the assets of Mersey Paper Co. Ltd of Liverpool, N. S., has been accepted by the Mersey board of directors. Mersey shareholders were to vote on the proposal late

Convert Logs into HIGH-QUALITY CHIPS

with Carthage Log Barkers, Log Splitters, Log Chippers, Slab Chippers, Chip Screens

For Example:

CARTHAGE NORMAN CHIPPER produces smooth, uniform chips—clean cut and low in sawdust. Multiple-knife design results in steady pressure on the log—prevents chattering. Heavy-duty construction—low maintenance costs. Also Carthage Standard Chippers.

Write for Complete Information

CARTHAGE MACHINE COMPANY CARTHAGE, NEW YORK

in June. The Liverpool firm is currently operating two newsprint machines with an annual output of some 140,000 tons. If Bowater acquires the plant, it will construct a groundwood pulp mill with a capacity of about 100,000 tons annually.

Cornell Paperboard Products Co. of Milwaukee has acquired all the outstanding capital stock of Superior Paper Products Co. Inc. of Marion, Ind., a producer of paper plates for home, bakery and industrial use.

West Virginia to Expand at Luke, Md.

West Virginia Pulp & Paper Co. has authorized a $50,000,000 expansion program at Luke, Md. The project at the Luke mill—the company's oldest—will extend over the next few years.

This will be the largest expansion program ever undertaken by the company at one location. It will ultimately boost Luke's production to more than 800 daily tons, or roughly double the present capacity.

N. B. Mill Plans Nearing Completion

The outlook for an early start on construction of a $65,000,000 newsprint mill at Lepreau, N. B., has been described as "very promising."

British and United States interests in the proposed mill are headed by Sir Robert McAlpine & Sons of London and Butler Co. of Chicago. The charter of Maritime Pulp & Paper Mills Corp. has been acquired.

Stadler, Hurter & Co., Montreal consulting engineers, will design the plant and auxiliary facilities for a 500- to 700-ton kraft newsprint mill. The plant will cost $50,000,000, plus additional $5,000,000 for facilities and $10,000,000 to cover the cost of an 80,000-hp thermal plant providing both electric power and steam.

B. C. Mill Considered

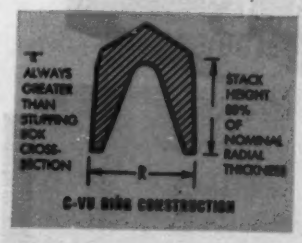
Proposals for the construction of a $20,000,000 pulp mill in the Peace River region of northeastern British Columbia have been revealed by Ray Williston, provincial lands and forests minister.

Williston explained that such a plant would be a natural development, since a railroad extension is now under construction to Dawson Creek and Fort St. John.

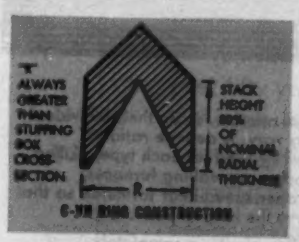
The minister declined to identify

Countless successful applications of C-V Rings under the most severe service conditions have made this the closest approach to a universal packing.

It will effectively handle all industrial acids, alkalis, solvents, organic and hydraulic fluids . . . temperatures from −120°F. to +500°F. . . . is equally suited to valves, pumps, mixers, hydraulic cylinders and like equipment.



"John Crane" C-V Rings have extremely low coefficient of friction. "Breakout" friction is only slightly higher than running friction.



TWO STYLES ARE AVAILABLE:

C-VU RINGS *for low pressure service* —such as control and regulator valves handling gases and fluids, where it is necessary to have a very sensitive and resilient type packing.

C-VH RINGS *for high pressure service* —for use in pumps, hydraulic cylinders and like services at pressures ranging to 500 psi. and over. These rings are constructed with a heavy wall heel to withstand pressure requirements. They are designed to provide voids between rings, so that as the Teflon expands due to heat, this take-up room minimizes any excess friction in the stuffing box.

"John Crane" C-V Rings are available in full line of standard sizes and male and female adaptors. Sizes can be molded to stuffing box specifications.

Request Bulletin T-110.

*"John Crane" C-V Rings are made from Chemlon—*the best in DuPont Teflon.*

Crane Packing Co., 6450 Oakton St., Morton Grove, Ill. (Chicago Suburb). *In Canada: Crane Packing Co., Ltd., Hamilton, Ont.*

the interested parties except to say that the firms involved are large British Columbia companies engaged in the forest industry.

Tappi a Charter Member of Water Examination Group

Nine organizations recently became charter members of the new Joint Committee on Uniformity of Methods of Water Examination at a meeting in Biloxi, Miss. Another organization has joined the group since the initial gathering.

Representing the pulp and paper industry is Tappi, which is represented among the officers by A. Thurn as vice chairman.

The purpose of the committee is to secure uniformity of content of the various methods by providing a mechanism for exchange of information; securing uniformity of terminology, and reviewing methods with respect to objectives, sampling, apparatus and reagents, procedure, reporting of results and application. The methods reviewed will include those covering natural water, potable water, industrial water, industrial waste water and sewage.

Organizations that have membership in JCUMWE in addition to Tappi are: the Committee on Disposal of Refinery Wastes of the American Petroleum Institute, American Public Health Association, American Society of Mechanical Engineers, American Society for Testing Materials, Association of Official Agricultural Chemists, Federation of Sewage and Industrial Waste Associations, Manufacturing Chemists Association, the U. S. Public Health Service (R. A. Taft Sanitary Engineering Center) and the Geological Survey of the U. S. Department of the Interior.

"From ingot to fourdrinier wire"

Just as one alloy differs from another, so do their individual requirements for annealling vary. A definite ratio of speed and temperature must be used for each type. Skilled employees, tending our modern annealling furnaces, adhere faithfully to the proper speed-heat formulae so that your Eastwood wire will have the longest possible life.

Because the Eastwood-Nealley plant is a *completely integrated* one, every wire we ship has undergone thorough and continual analysis, control and testing from the raw metals to your finished fourdrinier wire ready for quality paper production.

We are proud to say they are *truly ours*—"from ingot to fourdrinier wire".

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

Predicts End to Newsprint Shortage

An end to the newsprint paper shortage by the close of 1957 has been predicted by Charles F. Chaplin, general manager of the Allied Paper Mills Div. of Thor Corp.

Addressing the convention of the National Paper Trades Association, Chaplin pointed out that mills have been spending millions of dollars on new installations to relieve the shortage. These efforts, he said, will result in a surplus of all grades of paper by the end of 1958 or at the latest 1959.

In 1956, Chaplin explained, 37,600,000 tons of paper in all forms will be consumed, amounting to 427 lb. per capita. He predicted that by 1959 the population will have increased to 177,000,000, with a paper consumption (including imports) of 42,600,000 tons, or 481 lb. per capita.

Allied News Briefs . . .

Albany Felt Co. is holding open house at its new plant at St. Stephen, S. C., on October 19 during the joint meeting of the Southern and Southeastern divisions of the Superintendents Association, which is to be at the Francis Marion Hotel in Charleston.

Scapa Dryers Inc. has announced that its new dryer felt mill at Waycross, Ga., is now operating on a two-shift basis.

De Laval Steam Turbine Co. of Trenton, N. J., has opened a sales branch office in Moline, Ill. H. A. Besocke, formerly of the Chicago office is, manager.

Wyandotte Chemicals Corp. of

Wyandotte, Mich., has reported a 32 per cent expansion of its soda ash-producing facilities.

Hercules Powder Co. will enter into the wood naval stores industry in Mexico for the recovery and utilization of pine stumps.

American Cyanamid Co. will expand production to 72,000 annual tons of Unitane titanium dioxide pigment at its Savannah, Ga. plant.

Beloit Eastern Corp. at Downingtown, Pa., has purchased a 7½-acre tract and will expand its pipe-roll plant.

Mead Pulp Sales Inc. has been appointed exclusive sales agent for the production of the bleached sulfate pulp mill now under construction at Crofton, B. C., by British Columbia Forest Products Ltd.

Shuler & Benninghofen of Hamilton, Ohio, is offering a papermakers cap like the one now worn by the firm's trademark, "Ham Feltz." The free head piece will be given to any paper mill employee writing on his company letterhead.

Olin Mathieson Chemical Corp.'s Industrial Chemicals Div. has combined all research activities under the direction of Dr. Bruno H. Wojcik, manager of research and development, at Baltimore.

Food Machinery & Chemical Corp. has acquired the outstanding stock of Hudson-Sharp Machine Co. of Green Bay, Wis.

Allied Chemical & Dye Corp.'s National Aniline Div. has opened a branch office in Akron, Ohio.

Reichhold Chemicals Inc. will manufacture melamine resins under a license agreement with American Cyanamid Co.

Monsanto Chemical Co.'s Organic Chemicals Div. has added to its production capacity for Mersize fortified rosin size with a new manufacturing plant at Fieldsboro, N. J.

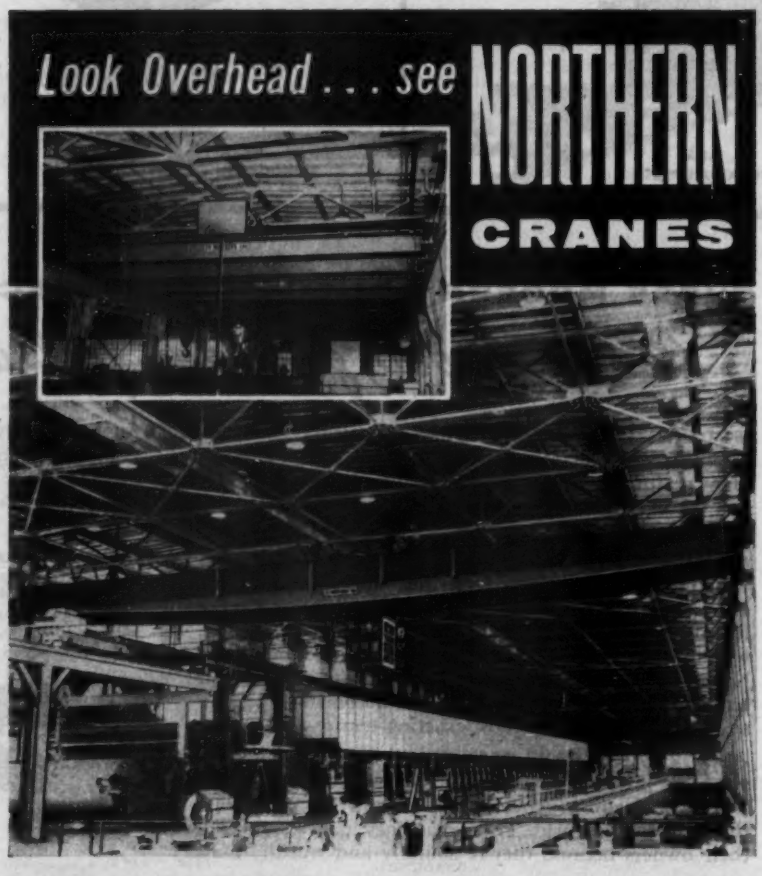
Graton & Knight Co.'s major assets have been transferred to Aetna Industrial Corp. (The transaction did not include G & K's subsidiary, International Packings Corp.)

John W. Bolton & Sons Inc. has broken ground at Lawrence, Mass., for its new pulp and paper research center.

American Cyanamid Co. has opened its new plant in Plymouth, N. C., for the production of liquid alum.

Shenango-Penn Mold Co. of Dover, Ohio, has been consolidated into the parent organization, Shenango Furnace Co. of Pittsburgh and is now known as the Centrifugally Cast Products Div.

Wyandotte Chemicals Corp. will



selected by leading paper mills

It is frequently said that there is no substitute for experience.

Rome Kraft Company's selection of NORTHERN CRANES for the machine, roll grinding, turbine and refiner rooms in its new plant at Rome, Georgia, reflects Northern's experienced responsibility for over fifty years in delivering the particular overhead materials handling service required in production type paper mills.

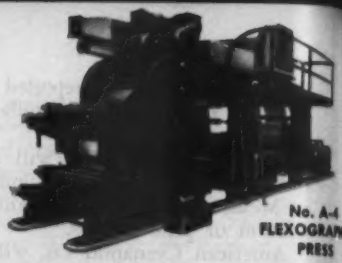
NORTHERN CRANES are fast, safe, dependable; designed and built for minimum maintenance, quick easy accessibility for service, for maximum efficiency of your invested capital.

NORTHERN MATERIALS HANDLING EQUIPMENT

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

No. 2-RA
ROTOGRAVURE PRESS

No. A-1
FLEXOGRAPHIC PRESS



No. A-4
FLEXOGRAPHIC
PRESS

THESE MODERN HUDSON SHARP MACHINES

Process paper, film and foil in record volume!

MODERNIZING OR EXPANDING? Look this line over carefully when determining your needs for expansion plans or for replacing obsolete machines that cost you a fortune in profits through inefficient and unsatisfactory production.

MACHINES FOR EVERY JOB — Hudson Sharp offers you the *right equipment* from the most complete line available. Illustrated are some of the machines we make for printing, packaging, laminating, waxing, embossing, winding, folding, creping, core cutting and bundling. Naturally, other types and models are offered to fulfill any specific need, either for in-line automation or unitized production of the most exacting nature.

PERFORMANCE PAYS OFF — You'll find Hudson Sharp machines producing work with remarkable capacity and fidelity in leading processing and converting plants throughout the world. These machines make money for their owners because they're soundly and sturdily built for heavy duty usage and are engineered with precision finesse for long life, constant running efficient operation. For the full story, contact our home office or your nearest Hudson Sharp representative.

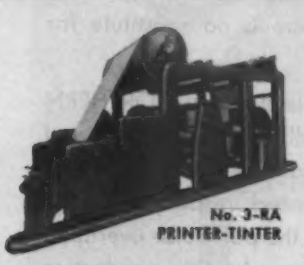
FREE GENERAL CATALOG — Yours for the asking on your company letterhead. It shows you the equipment we make . . . tells you briefly what each machine is all about so you can start the ball rolling on your planning needs. You'll want more detailed information later on.

HUDSON-SHARP

machine company

green bay, wisconsin

New York office: 55 West 42nd St.



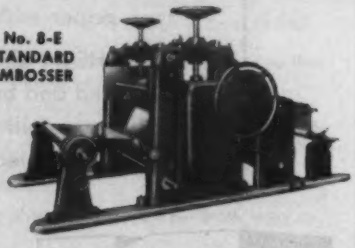
No. 3-RA
PRINTER-TINTER

PAPER ROLL AND
PACKAGE CUTTER

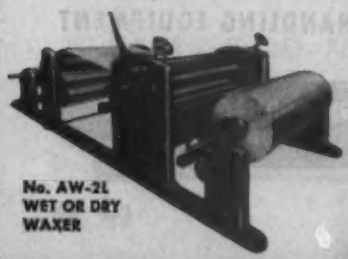
60-B
AUTOMATIC ROLL
WINDER AND EMBOSSER

No. 50-C CORE WINDER

No. 8-E
STANDARD
EMBOSSER

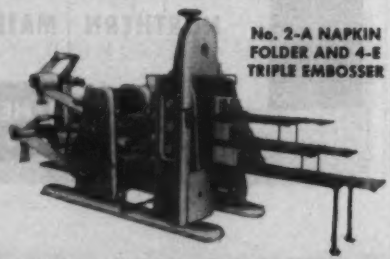


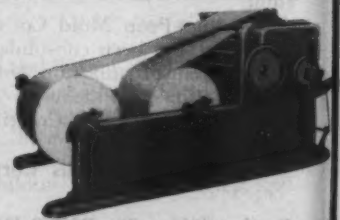
GL-2 GUMMER
AND LAMINATOR



No. AW-2L
WET OR DRY
WAXER

No. 2-A NAPKIN
FOLDER AND 4-E
TRIPLE EMBOSSER





No. 10-T ROTARY TOWEL INTERFOLDER

News of the Industry . . .

build an electrolytic chlorine-caustic soda manufacturing plant adjacent to its ethylene-oxide facility at Geismar, La.

Dow Chemical Co. plans to spend more than $75,000,000 for expansion in the fiscal year ending next May 31.

Hercules Powder Co.'s Cellulose Products Department has opened a sales office in St. Louis.

American Hoist & Derrick Co. of St. Paul, Minn., has acquired Lebus Rotary Tool Works Inc. of Longview, Texas.

Montana Sulphur & Chemical Co. of Billings is now operating its new 40-ton high-grade sulfur plant.

American-Standard's Ross Heat Exchanger Div. has opened a southeastern office in Decatur, Ga.

Hubinger Co. of Keokuk, Iowa, a supplier to the corrugating and boxboard container industries, is celebrating its diamond jubilee.

Milwaukee Shipbuilding Co. has announced that its name has been changed to **Paper Machinery Corp.** The change was made because the new name better describes the products of the firm.

Fisher Governor Co. of Marshalltown, Iowa, has named J. G. Chilcoat & Co. of Pittsburgh as its exclusive sales representatives for western Pennsylvania and West Virginia.

Hooker Electrochemical Co., Niagara Falls, N. Y., is now offering a new license agreement to kraft pulp bleachers concerned with processes involving chlorine dioxide and hydrogen peroxide or sodium peroxide.

Eastman Chemical Products Inc., subsidiary of **Eastman Kodak Co.**, has created a new chemical sales development section separate from its commercial sales dept.

Cameron & Barkley Co. has become a distributor for the full line of Mason-Neilan pressure reducing and regulating valves.

Coming Events

Tappi

Oct. 17-18—Sixth Corrugated Containers Conference, Hotel Statler, St. Louis, Mo.
Nov. 14-16—Alkaline Pulping Conference, Jung Hotel, New Orleans, La.
Nov. 30-Dec. 1—Southeastern Section, Brunswick, Ga.
Jan. 18-19—Southeastern Section, Jacksonville, Fla.
Mar. 22-23—Southeastern Section, Charleston, S. C.
May 24-25—Southeastern Section, Savannah, Ga.

Superintendents Association

Oct. 17-19—Southern and Southeastern Divs. (joint meeting), Francis Marion Hotel, Charleston, S. C.
Nov. 29-Dec. 1—Pacific Coast Div. (fall meeting), Multnomah Hotel, Portland, Ore.

Other meetings

Oct. 22-25—Eleventh Annual Protective Packaging & Materials Handling Exposition, Kiel Auditorium, St. Louis, Mo.
Oct. 22-25—National Safety Congress, Pulp & Paper Section, Conrad Hilton Hotel, Chicago.
Oct. 29-30-Nov. 1—Electrochemical Society, Statler Hotel, Cleveland, Ohio
Nov. 7-8—Instrument Society of America Symposium, Bellevue-Stratford Hotel, Philadelphia, Pa.
Nov. 12-14—National Paperboard Assn. and Fibre Box Assn. (annual meeting), Waldorf-Astoria Hotel, New York, N.Y.
Nov. 14-15—Material Handling Institute Traveling Clinics, University of Buffalo, Buffalo, N.Y.
Nov. 14-15—Material Handling Institute Traveling Clinics, Northwestern University, Chicago, Ill.
Nov. 26-30—Third International Automation Exposition, New York Trade Show Building, New York, N. Y.
Nov. 27-30—American Chemical Society, National Chemical Exposition, Cleveland

Trained for the Special Problems of the Pulp and Paper Industry

"When you're through improving — — you're through!"

Maintenance

"Control Center" Programs

. . . to improve maintenance labor and supervisory efficiency.

. . . to set up proper cost and planning systems and controls.

. . . to set accurate standards of maintenance performance.

Experienced

Time Study "Standards"

. . . to establish degree of efficiency and to raise performance of Converting, Finishing, Shipping and all direct labor operations.

Wage Incentives

. . . with emphasis on quality, both hourly and supervisory, for Pulp, Papermaking and Converting operations.

Write, wire or phone for further information on any one or all of these services

FEDERICI ASSOCIATES
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formerly . . . ASSOCIATED INDUSTRIAL CONSULTANTS

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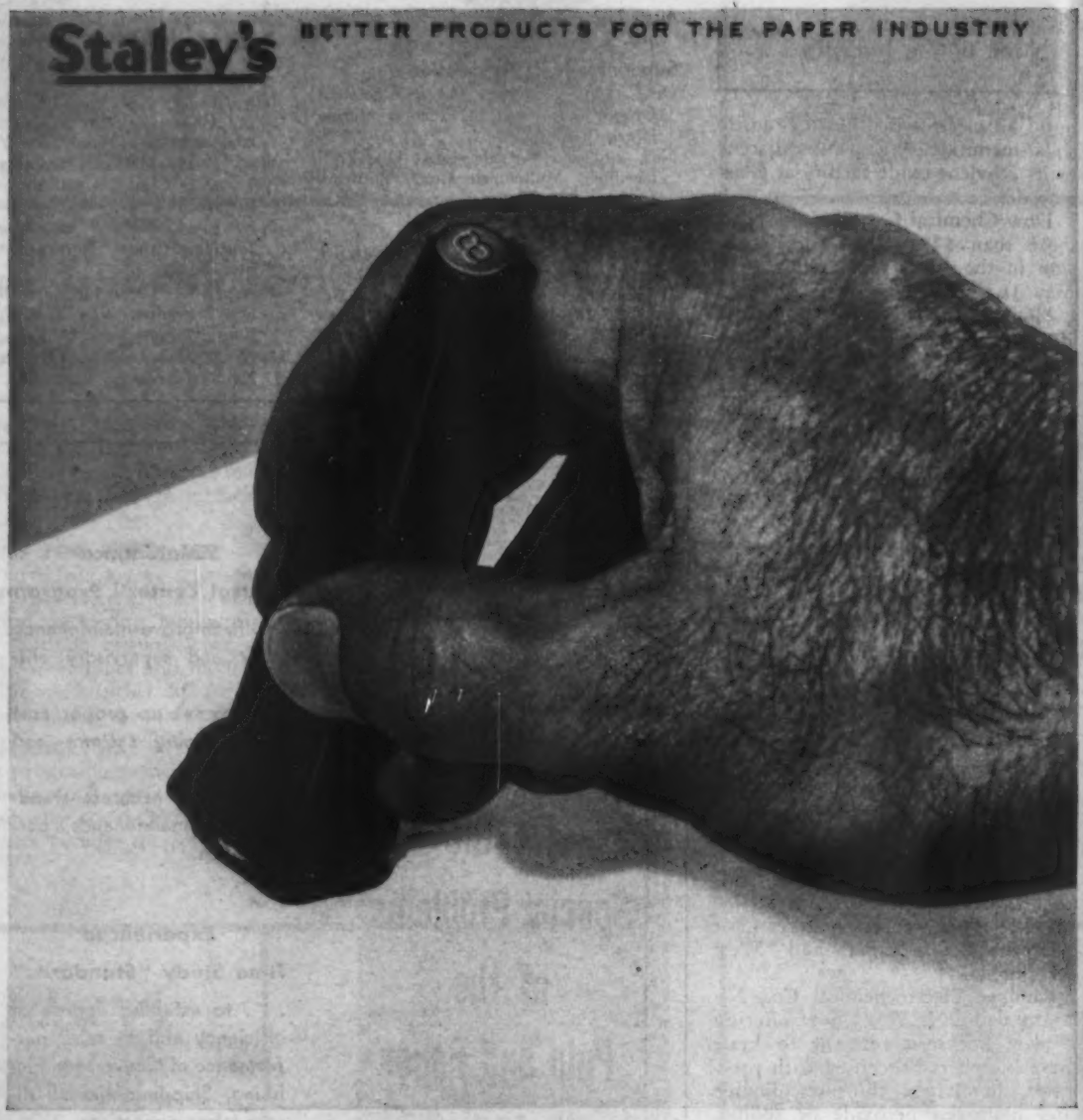
Staley's BETTER PRODUCTS FOR THE PAPER INDUSTRY



WAX-PICK TESTS PROVE...

Staley's new Stadex® Dextrin 140 gives greater binding strength in higher-solids coating colors

Higher adhesive quality! Now you can use high-solids coatings of low viscosity *without sacrificing surface strength.*

Staley's new improved Stadex Dextrin 140 solves the problem of poor binding strength in high-solids coatings once and for all. Stadex Dextrin 140 is a high-solids clay coating adhesive with excellent stability, viscosity and binding strength characteristics. Used either alone or in combination with Stayco® (oxidized) starches, Stadex Dextrin 140 produces a coating of high adhesive quality.

Long a standard in the paper industry, Stadex 140, like all Staley dextrins, is now made by a brand new dextrinization technique that guarantees you even better adhesives of top quality, minimum color and unparalleled uniformity.

Why not get the full story on Stadex 140 for yourself now?

See your Staley representative or write us for details today.

Staley's®

A. E. Staley Mfg. Co., Decatur, Ill.

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New York • Philadelphia • San Francisco • St. Louis

NAMES *in the* NEWS

FOUR WEST VIRGINIA Pulp & Paper men recently promoted are (l to r) Perry Bartsch, Henry W. Mooseker, Leroy Fisher and William McMinn

West Virginia Promotes

West Virginia Pulp & Paper Co. mills at Tyrone and Williamsburg, Pa., have announced the promotion of seven Westvaco men to key posts.

Henry W. Mooseker, former general superintendent in charge of production, has been named Tyrone general superintendent. William McMinn, technical assistant to the Tyrone paper mill superintendent, has been advanced to the position of paper mill superintendent. Leroy Fisher is being transferred from Williamsburg to Tyrone, where he will be technical assistant to the paper mill superintendent.

Perry Bartsch, in charge of market research and financial analysis, now heads the accounting functions of both mills.

Kenneth Hunt, former technical director at Williamsburg, has been promoted to general superintendent. His successor as technical director is Woodrow W. Stultz, former research chemist. And Gilbert C. Robinson, superintendent of the experimental pulp mill at Covington, Va., will be transferred to Williamsburg as pulp mill superintendent.

Brown Co. Promotes Two

Brown Co. has announced the promotion of John Hegeman as production manager of the kraft and sulfite mills and of Theodore M. Brown as control superintendent of the two mills.

Hegeman has been serving as assistant manager of the pulp mills. He joined the company in 1946 as chemical engineer and left in 1949 to work for Congoleum-Nairn Inc. Returning to the company in 1950 as kraft mill chemist, he was promoted to assistant superintendent of the kraft mill in 1950 and to technical supervisor of the pulp division in 1952.

Brown joined Brown Co. in 1926 as a research chemist. Following 21 years in research work, he transferred to manufacturing, serving first as chief technical control chemist. In 1948 he was promoted to plant chemist, in 1950 to technical control supervisor and in 1955 to technical supervisor.

J. Hegeman

H. D. Cook

H. D. Cook Named to N. Carolina Faculty

Hilliard D. Cook, a Phoenix, N. Y. consulting engineer, has been named lecturer and consultant in pulp and paper technology in the School of Forestry at North Carolina State College.

A graduate of the Massachusetts Institute of Technology, Cook was for 12 years research chemist, tour boss and assistant superintendent at S. D. Warren Co. in Cumberland Mills, Maine. He was later general superintendent and general manager for Sweet Bros. Paper Mfg. Co. in Phoenix.

During the past several years he has been self employed as a consulting engineer and has handled a variety of paper mill problems both in the United States and abroad. Cook is a past chairman of both the New York-Canadian Div. of the Superintendents Association and the Empire State Section of Tappi.

St. Regis Elects Cowles

John E. Cowles has been elected treasurer of St. Regis Paper Co. to succeed the late William H. Versfelt.

Cowles has been assistant treasurer and comptroller of Maine Seaboard Paper Co. since 1933, and he joined St. Regis as comptroller when that company acquired Maine Seaboard in 1947.

Elected to succeed Cowles as comptroller was Harold F. Stevens, assistant comptroller since 1947.

J. E. Cowles

W. Atkinson

William Atkinson Jr. has been appointed safety supervisor of plant operations for Robert Gair Co. Inc. Before joining Gair, Mr. Atkinson was with Liberty Mutual Insurance Co.

Robert A. Rabatsky has taken over the duties of vice president in charge of production for all plants of Hankins Container Co., Cleveland. **William J. O'Bryan** will succeed him as superintendent of Elmira, N.Y. operations.

William B. Goodwin, formerly of Deering Milliken Inc. (McCormick Spinning Mill Div.), has joined the Polychemicals Div. of West Virginia Pulp & Paper Co., Charleston, S.C., for product and uses development work on new products based on lignin.

HOW NATIONAL KNOW HOW PAYS OFF IN YOUR MILL

Our laboratories should be *your* first step in developing new colors. That way, running colored lines can be less of a problem than you may think. With proper laboratory formulas they often are neither too costly nor too difficult to handle in your mill. National Aniline paper technicians can give you worthwhile help on methods best suited to your operating conditions.

This is part of our complete color service to paper mills. We invite you to take full advantage of it.

NATIONAL® PAPER DYES

NATIONAL ANILINE DIVISION ALLIED CHEMICAL & DYE CORPORATION • 40 RECTOR ST. NEW YORK 6, N. Y.

Boston Providence Philadelphia Chicago San Francisco Portland, Ore. Greensboro Charlotte Richmond Atlanta Los Angeles Columbus, Ga. New Orleans Chattanooga Cleveland Toronto

Allied Personalities . . .

Vance P. Edwardes of Corinth, N. Y., a leading authority on pulp and paper production, has been named consultant to the Soda Products Div. of Diamond Alkali Co.

D. G. Moon, who has been acting as consultant and head of the pulp and paper department of J. E. Sirrine Co., has been elected vice president of that company. Moon obtained his early experience in the design and construction of a number of hydroelectric plants in Wisconsin.

R. F. Hendren, manager of plants of Chicago Bridge & Iron Co., Chicago, Ill., has been elected a vice president of the firm. Hendren has been a director of the company since 1946 and manager of plants since 1947.

William A. Gormley is now sales manager of the ACF lubricated plug valve department of W-K-M Mfg. Co. Inc. Gormley was with the former ACF Valve Div., Detroit, for 20 years.

John P. Cartwright has been appointed sales manager, industrial sales of Joy Mfg. Co., Pittsburgh. Cartwright joined the Joy company in 1950.

Lawrence L. Garber has been named vice president in charge of production for H. K. Porter Co. Inc. **Eugene Salinger** has been appointed general manager of Porter's Henry Disston Div., succeeding Garber.

Dr. J. William Zabor has been named director of research for Wyandotte Chemicals Corp. Dr. Zabor joins Wyandotte from Pittsburgh Coke & Chemical Co., where he was director of research.

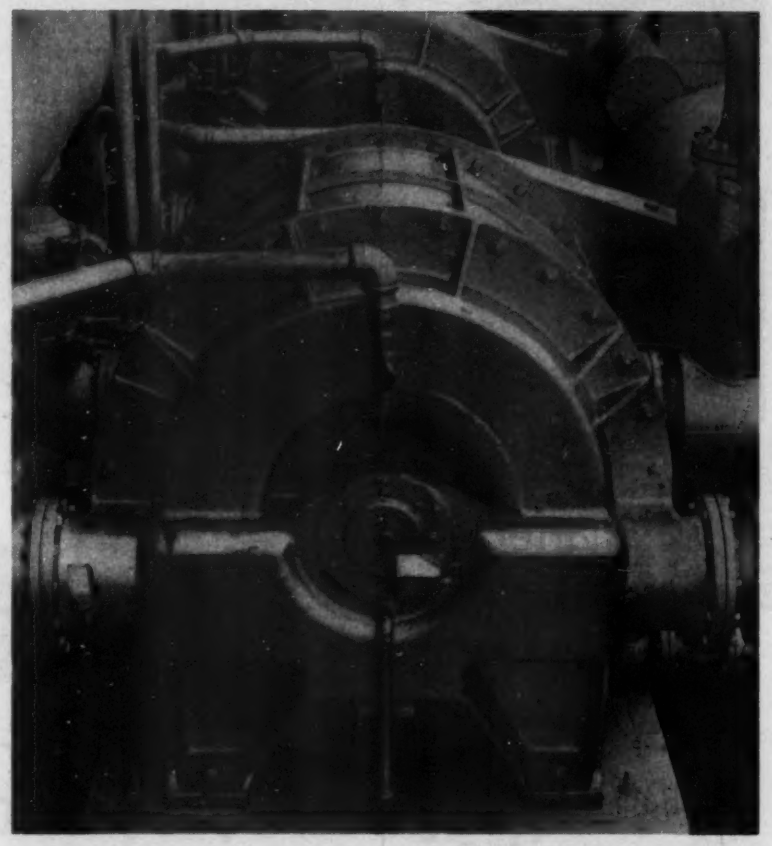
Crane Co. announces executive appointments in two of its major sales divisions. **J. W. Greene,** district manager since 1954, became director of industrial sales. **W. A. Burbine,** who has been Mid-west district manager since 1948, was named director of heating sales.

Necrology . . .

William H. Versfelt

William H. Versfelt, 58, died unexpectedly early in September in New York City. He was vice president, treasurer and a director of St.

High machine speeds?
High temperature headbox stock?
You need NASH Vacuum Pumps!



Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

441 WILSON ROAD, SO. NORWALK, CONN.

We think it is smarter to play safe. Observe all safety rules and use

Swagelok® FITTINGS

GET ALL THE FACTS: Write for the Swagelok catalog. Address Dept. P9

CRAWFORD FITTING CO.
884 EAST 140th STREET
CLEVELAND 10, OHIO

Regis Paper Co. and had been with the firm since 1921, when he joined the financial department.

Mr. Versfelt was named assistant treasurer in 1928 and became treasurer in 1935. In 1939 he was elected a director, and vice president in 1945.

In addition to his positions with St. Regis, Mr. Versfelt was vice president, treasurer and a director of St. Regis Paper Co. (Canada) Ltd., St. Regis Timber Co. Ltd., North Western Pulp & Power Ltd., and the Norwood & St. Lawrence Railroad. He was vice president and director of Eastern States Corp. and a director of Cambridge-Panelyte Molded Plastics Co.

W. H. Versfelt

P. D. Parsons

P. D. Parsons

Philip D. Parsons, 80, an engineer with Scott Paper Co. until his retirement in 1951, died early in September in Ocean City, N. J.

Mr. Parsons joined Scott in 1914 and during his 36-year career designed and developed much of the company's finishing and packaging equipment. He was also responsible for the development of many of Scott's tissue towel fixtures.

Lewis H. Breyfogle

Lewis H. Breyfogle, sales representative for Draper Bros. Co., died at his Kalamazoo, Mich. home recently.

Born in 1870 in Delaware, Ohio, Mr. Breyfogle entered the paper industry in 1884 as a cutter boy in the Randall & Edsell mill at Stratford, Ohio. He later became superintendent for Western Board & Paper Co. in Kalamazoo, after which he held a similar position with the old Standard Paper Co. of the same city. Mr. Breyfogle joined the sales staff of Draper Bros. about 38 years ago.

In 1941 he was honored with a life membership in the American Pulp & Paper Mill Superintendents Association and in 1954 received special recognition at a meeting of the Association's Northwestern Div. More recently, a scholarship fund was established in his name in the Department of Paper Technology at Western Michigan College.

William O. McKay

William O. McKay, chairman of the executve committee of Great Northern Paper Co., died in early September at a Boston hospital. He was 66.

Mr. McKay joined Great Northern in 1908. He was appointed assistant to the general manager in 1926; vice president in charge of manufacturing in 1928; a director in 1936, and president in 1946.

In addition to his responsibility for the firm's public relations, Mr. McKay was identified prominently with the installation of manufacturing equipment in Great Northern plants and the development of hydroelectric properties.

Lawrence T. McCurdy

Laurence T. McCurdy, a vice president of Container Corp. of America, died in a Germantown, Pa. hospital in August. He was 59 and had been with the firm 38 years.

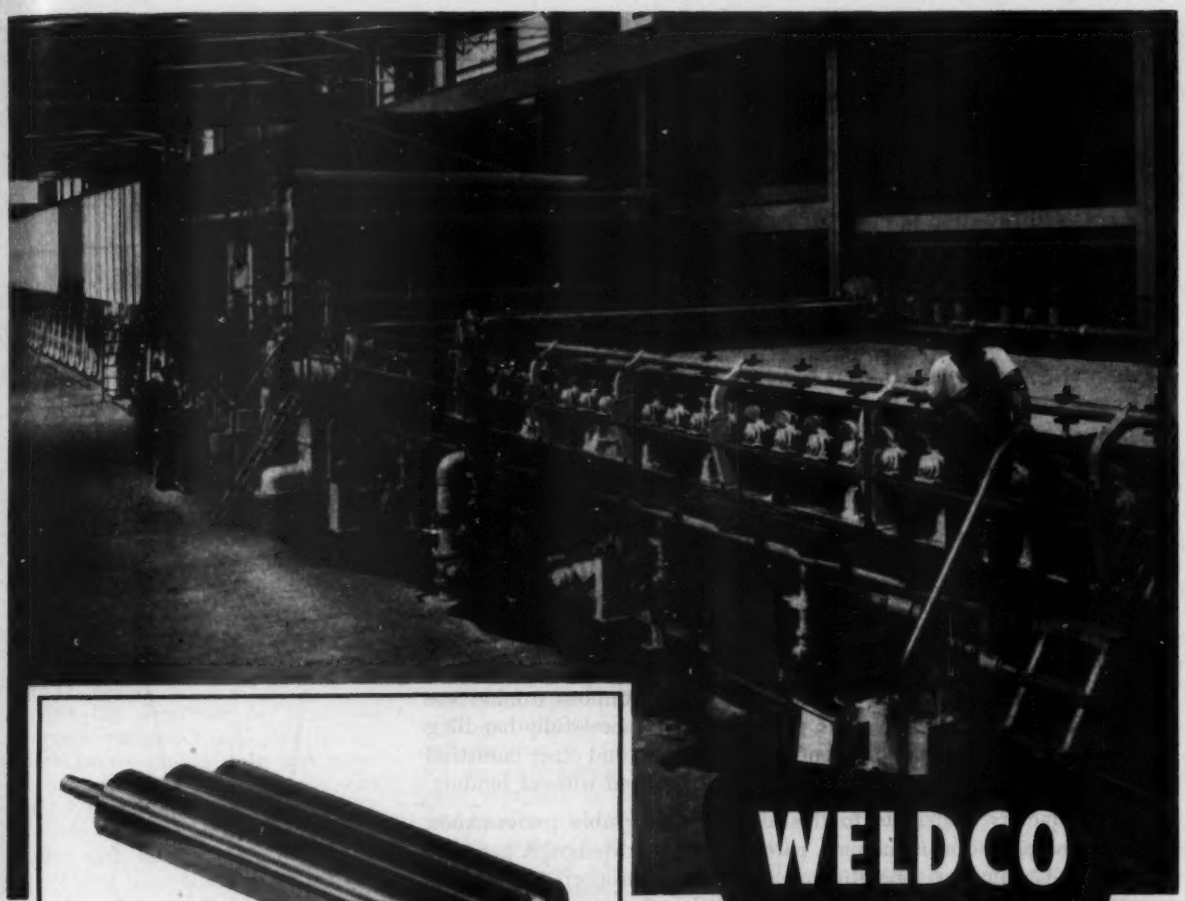
Lewis E. Van Sickle, who retired in 1946 as head of the kraft paper department of West Virginia Pulp & Paper Co., died in September in Rutland, Vt. He was 77.

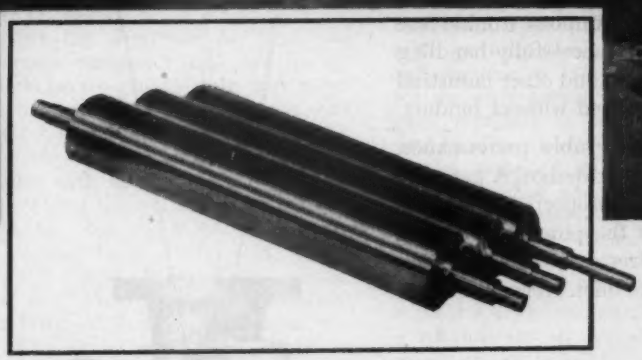
George Kreutzer, 57, pulp mill superintendent for National Container Corp. of Wisconsin at Tomahawk, died in September.

Walter Millhouse, a representative for Cameron Machine Co., died suddenly at his home in Tuscaloosa, Ala. Prior to his becoming Cameron sales representative in the South, he had been the field engineer in charge of several major winder installations both in this country and in Europe.

John Neller, 75, president of Wisconsin Wire Works, died in August. He had been president of the firm since 1937 and an officer for 25 years.

J. B. Norman, 61, general manager of the National Pole & Treating Div. of Minnesota & Ontario Paper Co., died in Minneapolis September 17. Mr. Norman joined Mando in 1923 as chief clerk of the purchasing department, became director of purchases in 1941 and general manager of the NP&T Div. in 1950.





WELDCO ROLLS

. . . Help Produce Top-Quality Paper and Paperboard in new Virginia Paper Plant

The new Paper Machine shown above, produces paper of top-quality and uniformity, and represents the latest in modern paper-making equipment. Since great stress was placed on the newest, most efficient equipment for the company's modernization program, WELDCO Stainless Steel Roll Covers were chosen for the rolls in the Fourdrinier-type paper-making unit.

WELDCO-Covered Rolls are used in many other mills, too, because they offer maximum corrosion-resistance, reduce friction, have superior wettability, increase felt life, and lessen wear on fourdrinier wires. Their smooth, highly-polished surface won't chip, peel, crack or blister — gives many years of economical service, with very little maintenance.

WELDCO

Both new and old rolls can be covered with Stainless Steel, Monel, Nickel, Inconel, or other alloys, through the patented WELDCO "Pressure Welding" process. For your next machine—new or reconditioned—be sure to specify WELDCO Rolls. Ask your paper machinery builder about them, or contact us direct.

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NEW ANGLE IN PUMP DESIGN

enables this I-R Paper Stock Pump

- **to handle all normal consistency stocks**

plus

- **Heavy stocks, to 10% consistency**

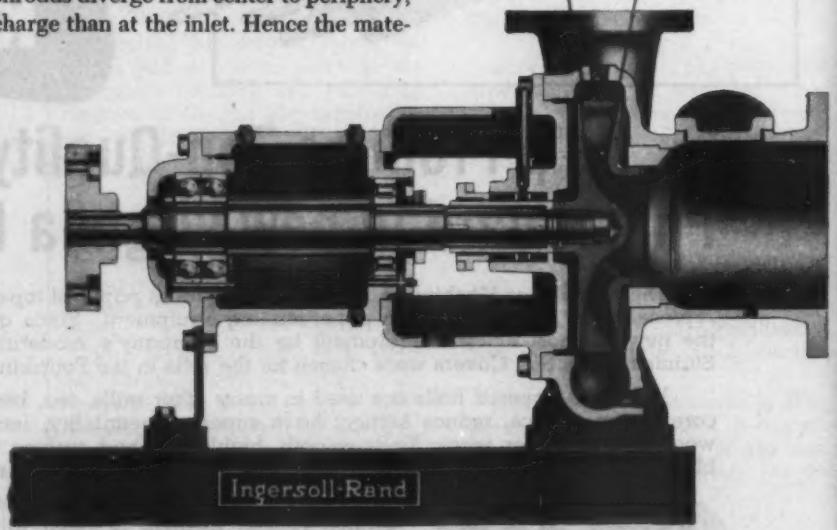
plus

- **Stocks and other liquids containing entrained air without clogging or air binding**

Ingersoll-Rand's radically new Paper Stock Pumps, Class EL, EM and EH, have thoroughly demonstrated their ability to give continuous, trouble-free performance on the toughest stock pumping jobs—successfully handling stocks up to 10% consistency, without clogging. Stocks and other industrial liquids carrying entrained air or gas are easily handled without binding.

Many factors contribute to this almost unbelievable performance, but the most significant is the new, patented impeller design. A patented DIVERGING impeller, operating in a specially proportioned casing, prevents air binding, eliminates clogging, makes the pump self-venting and self-regulating. The impeller shrouds diverge from center to periphery, providing a larger area at the discharge than at the inlet. Hence the material pumped cannot enter fast enough to replace the ejected liquid and a vacuum space is formed between the blades. Any entrained air or gas will enter the vacuum space and pass through the pump without vapor binding. Heavy stocks are handled without clogging or dewatering, passing through the pump at lower velocities and without abrupt acceleration.

For complete information on this radically new I-R Centrifugal Pump, send for Bulletin 7325-A.



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SAFETY NEWS

15 Perfect Records Reported for Six Months by SPPSA

A TOTAL OF 15 perfect scores have been reported for the first six months by participants in the annual competition sponsored by the Southern Pulp & Paper Safety Association. Of these, seven are mills; three bag plants; two box plants, and three woods operators.

In the mill division, Coosa River Newsprint Co. at Coosa Pines, Ala., leads with a 0.00 frequency rate in 919,212 man-hours of exposure. Safety supervisor at Coosa is Robert C. Baker.

For the first half of 1956, the average frequency rate for the 64 participants among pulp and paper mills was 6.45. Last year the rate was 7.43, while in 1954 it was 7.32.

Other perfect scores among the mills, with man-hours shown in parentheses, were: Georgia Kraft Co., Macon, Ga. (576,997); Buckeye Cellulose Corp., Foley Fla. (541,982); Riegel Paper Corp., Acme, N. C. (534,531); National Container Corp. of Virginia, Big Island, Va. (243,783); Certain-Teed Products Corp., Savannah, Ga. (220,125), and Banner Fibre Board Co., Wellsburg, W. Va. (40,145).

Converting Industries

Leader among the bag plants was St. Regis Paper Co. at Franklin, Va., where a perfect score was recorded in 402,978 man-hours of exposure. The average frequency among all bag plants was 7.06. For the year 1955 it was 4.22 and in 1954, 4.53.

The two other perfect records in this group were achieved by Kraft Bag Corp. at St. Marys, Ga. (260,133), and Albemarle Paper Mfg. Co. at Richmond, Va. (184,377).

Box plants had an average rate of 7.46, as compared to 8.77 in 1955 and 11.20 in 1954.

The two perfect scores were by International Paper Co. at Springhill, La. (266,953), and by St. Joe Paper Co. of Port St. Joe, Fla. (125,790).

The three woods operations with 0.00 frequency rates were: North Carolina Pulp Co., Plymouth, N. C. (197,915); St. Regis Paper Co. (Southern Woodlands), Pensacola, Fla. (124,827), and Robert Gair Co. Inc. (Southern Advance Bag & Paper Div.), Hodge, La. (95,064).

Best All-Time Rates Given in NSC Booklet

The National Safety Council has recently released the 1955 edition of its booklet, *Accident Rates*.

Featured among the many statistics contained in the publication are the rates for major and minor industries and segments of individual industries for the years during which they have been reporting to the NSC. Some date back to the early 1920s.

Also contained in the booklet are the all-time best no-injury records for the major and minor industries listed by the Council. Record-holder for pulp and paper is Dixie Cup Co. at Easton, Pa., with 3,770,076 man-hours without a disabling injury.

All-time records in individual segments of the pulp and paper industry are as follows:

Bags and Specialties—Dixie Cup, Easton, Pa. (3,770,076 man-hours); **Book and Cover**—Hollingsworth & Whitney Co., Waterville, Maine (3,343,598); **Boxes and Containers**—Marathon Corp. (Wausau Div.), Wausau, Wis. (1,580,878); **Building Board**—Cornell Wood Products Co., Cornell, Wis. (1,750,000); **Coated and Glazed**—Marathon, Menominee, Mich. (857,160); **Folding Paper Boxes**—Container Corp. of America, Philadelphia (2,605,616); **Newsprint**—Consolidated Paper Corp. Ltd. (Wayagamack Div.), Three Rivers, Que. (3,197,801); **Paperboard**—Container Corp., Carthage, Ind. (1,228,416); **Paper Mills**—Longview Fibre Co., Longview, Wash. (2,612,656); **Pulp Mills**—Buckeye Cotton Oil Co. (Cellulose & Specialties Div.), Memphis, Tenn. (2,617,756); **Roofing**—Flintkote Co. (Pioneer Div.), Los Angeles (1,711,756); **Tissue**—Ecusta Paper Corp. (Paper Div.), Pisgah Forest, N. C. (3,190,170), and **Wrapping**—Crossett Paper Mills, Crossett, Ark. (1,801,049).

Extensive Program Planned for National Safety Congress

From the woods to the finished product—that will be the scope of the program planned for meetings of the Pulp & Paper Section during the forthcoming National Safety Congress. The annual gathering—to be staged at the Conrad Hilton Hotel in Chicago October 22-25—will feature outstanding safety experts from the United States and Canada.

Keynoting the opening session will be R. J. Askin, vice president for manufacturing of Abitibi Power & Paper Co. Ltd., whose subject will be, "What's the Score?"

Completing the opening day's program will be the report of the nominating committee and the election of 1956-57 officers.

Three Featured Speakers

On Tuesday, October 23, three speakers will discuss various aspects of safety in the industry: George W. Harper, superintendent of the Division of Safety Inspection and Education for the Illinois State Department of Labor; Dr. Ralph Caston, physicist for Kimberly-Clark Corp., and Dr. Robert L. Quimby, division medical director in the Loss Prevention Department of Liberty Mutual Insurance Co.

Annual Awards

A highlight of the combined luncheon with the Wood Products Section will be the presentation of the Edward Benton Fritz Memorial Trophy, which is given annually to the mill having the most outstanding safety record for the previous year. In charge of the award will be A. Scott Dowd, publisher of THE PAPER INDUSTRY, donor of the trophy.

Also on the luncheon program will be the giving of the Arthur Hoyt Scott Award, presented each year to that company having the best accident frequency rate in multi-plant operations.

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PATENT REVIEWS

MELVIN NORD*

Water drainage blade for fourdrinier machine

U. S. 2,744,454, issued May 8, 1956, to Arthur P. Wagenknecht, describes a blade construction for use below a fourdrinier machine, for draining water from the bottom of the wire.

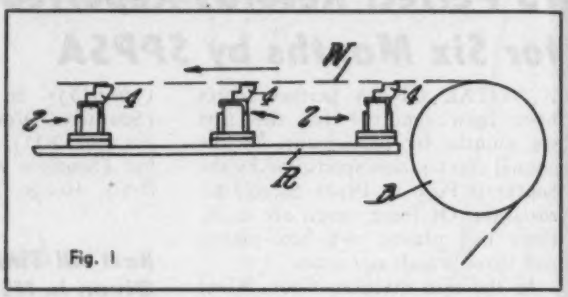


Fig. 1

Fig. 1, shows a breast roll B of a fourdrinier machine and a fourdrinier wire W. A side rail is represented by R. Drainage blades of the invention are represented by 2. The drainage blade construction includes an elongated laminated plastic blade 4 carried by a supporting beam.

According to the inventor, water removal is more efficient than with table rolls, so that wire speeds may be increased with less wear of the wire.

Paper machine reel starter

U. S. 2,746,606, issued May 15, 1956, to Minnesota & Ontario Paper Co., and invented by Foster D. McCormack, describes a paper machine reel starter which is designed to reduce papermaking wastes when the paper web is transferred from completed paper roll to a new spool.

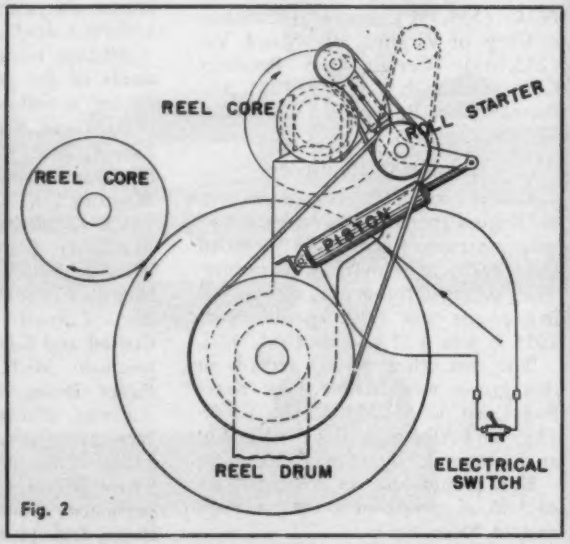


Fig. 2

The invention allows the spool to attain paper machine speed before it is brought in contact with the web. V belts are used to transfer speed from the reel drum to the reel spool. With the web and the spool moving at the same speed, the likelihood of web breaks is lessened.

The invention also calls for rubber covered reel spools which prevent scoring or marking of the reel drum surface.

*Patent attorney, 17600 Pinehurst, Detroit 21.

Apparatus for preparing pulp from waste paper

U. S. 2,727,439, issued Dec. 20, 1955, to Philip S. Bolton and Paul W. Horeyseck, and assigned to Robert Gair Co., Inc, describes an apparatus for defibering paper without disintegrating or breaking up desired extraneous or foreign material, such as: cellophane, fruit peelings, rubber, match sticks, wood shavings, etc.

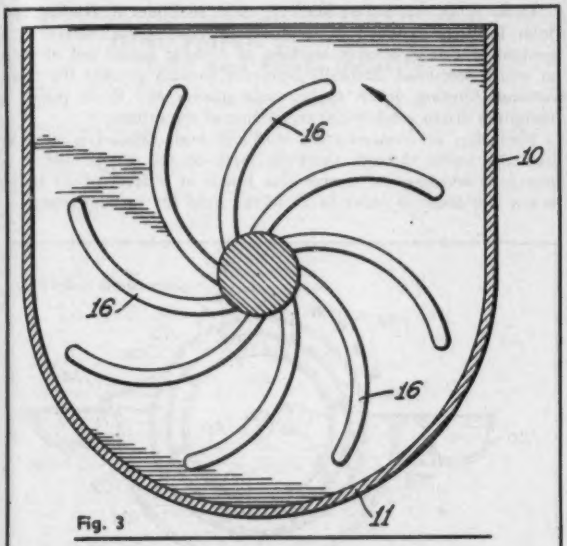


Fig. 3

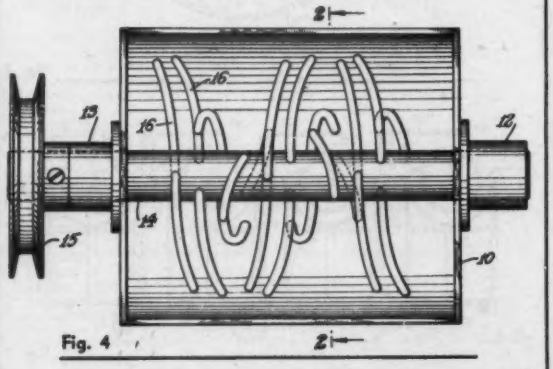


Fig. 4

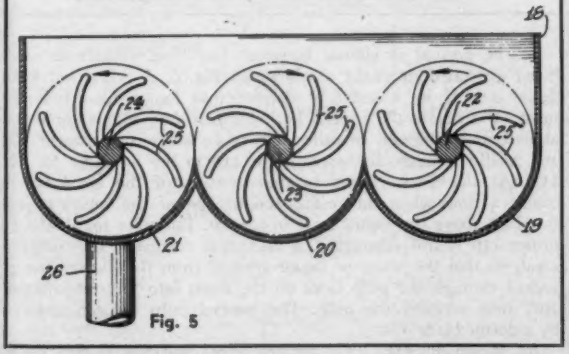
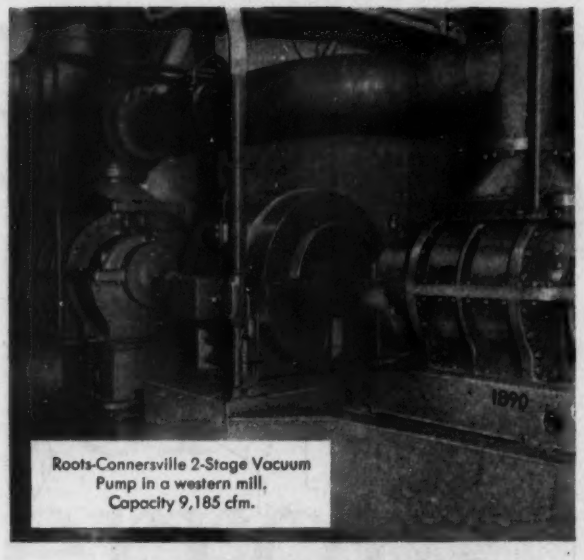


Fig. 5

The apparatus is shown in Figs. 3 and 4. The high density pulp mass containing the lightweight foreign material is placed in the tank ten, and the agitator shaft 14 is rotated at a sufficient speed and for a sufficient time to produce by fiber on fiber friction, the necessary defibering of the stock. The stock is then diluted with water to a density less than 1 per cent and passed over a screen having 1/8 in. perforations. The material rejected by the screen will be almost entirely unbroken foreign material.

Fig. 5 shows a modification which is useful for continuous operation.


Roots-Connersville 2-Stage Vacuum Pump in a western mill. Capacity 9,185 cfm.

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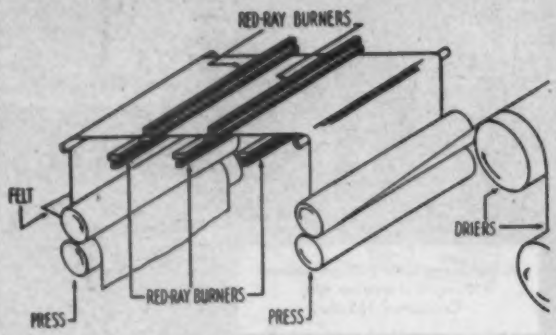

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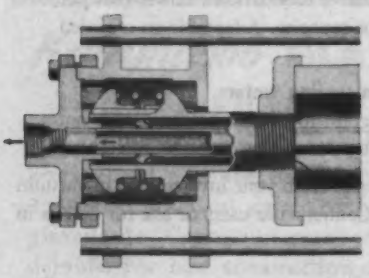
The Type LJ Johnson Joint has lugs cast right on the body to accommodate supporting rods. This design lifts the weight of the body from the rotating assembly—permits it to "float" freely inside. Joint shown at left is for syphon pipe service, has steam inlet in side of body 90° from lugs. Type LJ is also available for thru flow service.



Write for complete information. **Johnson Joints are also furnished in pipe-supported and self-supported types.**

The Johnson Corporation

345 Wood St., Three Rivers, Mich.

Patent Reviews . . .

Countercurrent washing of cooking liquor out of pulp

U. S. 2,745,712, issued May 15, 1956, to Elmer R. Burling and John P. Rich, assigned to Improved Machinery Inc., describes a method of counter-current washing of cooking liquor out of pulp in which low-head internally-generated vacuum permits the tanks between filtering drums to be made smaller and to be placed a minimum distance below the center line of the drums.

Normally, in countercurrent washing, high vacuum is used to pull the liquor through the pulp layer on the drums, and it is therefore necessary to receive this liquor at a level of 25-38 ft. below the drum in order to avoid the need for vacuum pumps.

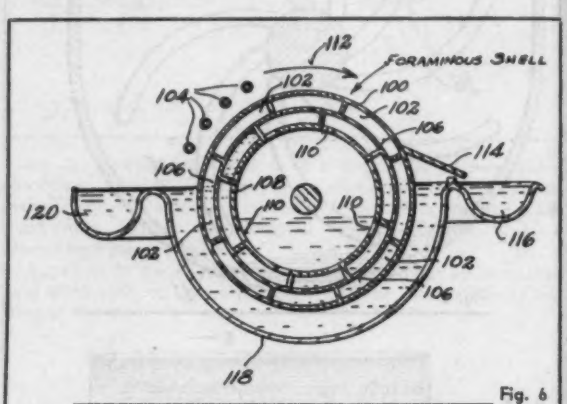


Fig. 6

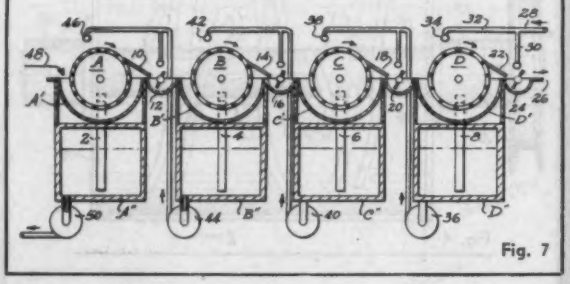


Fig. 7

In the present invention, however, low head vacuum is used, being generated internally as shown in Fig. 6. A cylindrical filter drum covered by a screen is divided into longitudinal compartments 102 below the screen. Each compartment 102 is connected at its bottom through an orifice 106 to an inner compartment 108 and finally through discharge orifice 110 to the liquid in the vat 118. As the drum rotates in the direction of the arrow, there comes a time when the orifice 106 of one of the compartments is raised above the liquid level in the vat. But since the discharge orifice 110 is still submerged, a vacuum is created in the compartment, so that the water or liquor sprayed from the shower 104 is sucked through the pulp layer on the drum into the compartment 102, thus washing the pulp. The washed pulp is later removed by a doctor blade 114.

As shown in Fig. 7, a countercurrent washing system using such drums is very simple, the liquor tanks A", B", C", D", being directly below each drum.

Production of opaque coated paper

U. S. 2,746,878, issued May 22, 1956, to James A. Rush and assigned to Consolidated Water Power & Paper Co., describes a process of producing opaque coated paper suitable for the production of waxed food wrapping.

The process consists of coating a thin, porous, absorbent, translucent paper having a machine glazed surface, by (1) applying to the glazed surface an excess of an aqueous suspension containing mineral filler and opacifying pigment together with rubber latex as the organic binder; (2) doctoring excess coating from the surface while the sheet is carried by a resilient moving surface; (3) drying the resulting coated sheet; (4) imprinting the resulting coated surface, and (5) waxing the printed sheet.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Method for forming liners for paper containers	Oswego Falls Corp.	2,736,065	2/28/56
Drying apparatus for lengthy web material	Julien Dungler	2,736,107	"
Collapsible carton adapted for potted plants	Sutherland Paper Co.	2,736,138	"
Vane type stock inlet	Beloit Iron Works	2,736,247	"
Bottle carrier	Gaylord Container Corp.	2,736,460	"
Dispensing carton	Alford Cartons	2,736,484	"
Box with readily attachable end closure	National Container Corp.	2,736,485	"
Box with inwardly telescoping cover	National Container Corp.	2,736,486	"
Cover lock for a container	Gaylord Container Corp.	2,736,487	"
Winder shaft puller and table	Beloit Iron Works	2,736,507	"
Means for defibrating and grinding paper pulp	Cornelius Laviste	2,742,825	4/24/56
Producing machine-made tubular bags with gusset-folding sides.	John Dickinson & Co., Ltd.	2,742,826	"
Article supporting and containing cartons	Federal Paper Board Co., Inc.	2,743,009	"
Carton setting up machine	Fiberboard Products Inc.	2,743,651	5/ 1/56
Fiber mat forming apparatus	Cascades Plywood Corp.	2,743,758	"
Pulping apparatus	A. B. Defibrator	2,744,012	"
Artificial board	Rodger M. Doriand and Paul E. Roberts	2,744,013	"
Fruit box	Wabash Fibre Box Co.	2,744,018	"
Continuously feeding and spraying wood wool	Peoples Research & Mfg. Co.	2,744,045	"
Method of making paper-covered folding box blanks	Chicago Mill & Lumber Co.	2,744,046	"
Preparing decorative laminates	Masonite Corp.	2,744,047	"
Adjusting distributing roll in paper making machines	Nicholas J. Niks	2,744,452	5/ 8/56
Reverse press assembly	Beloit Iron Works	2,744,453	"
Paper container making machine	National Paper Bottle Co. Inc	2,744,455	"
Paper coating machine	Minnesota & Ontario Paper Co.	2,744,492	"
Combination box and cradle for decorated easter eggs	George C. Sparks	2,744,622	"
Combined collar protector and shirt board	Para-Lux Products Co.	2,744,623	"
Packaging device	Norton Co.	2,744,624	"
Shipping container	Allied Plastics Co.	2,744,675	"
Container for merchandise	Federated Department Stores Inc.	2,744,676	"
Incinerator for pulp residual liquor	The Babcock & Wilcox Co.	2,744,812	"
Making fiberboard of uniform density and thickness	The Long-Bell Lumber Co.	2,744,848	"
Apparatus for kneading pulping	The Commonwealth Engineering Co. of Ohio	2,745,321	5/15/56
Diaphragm operated vacuum control system	Arthur E. Broughton	2,745,322	"
Flat top container fabricating machine	Ex-Cell-O Corp.	2,745,323	"
Display boxes	Brown & Bailey Co.	2,745,543	"
Bag support	Waldorf Paper Products Co.	2,745,545	"
Paper cup with stirring spoon	Edwin L. Thoma	2,745,586	"
Partitioned container	Sutherland Paper Co.	2,745,587	"
Dispensing container	Waldorf Paper Products Corp.	2,745,588	"
Carton	The Ottawa River Paper Co.	2,745,589	"
Portable bin	Fisher Flowing Mills Co.	2,745,590	"
Stay tape	The Brown-Bridge Mills Co. Inc.	2,745,591	"
Easy opening corrugated paperboard carton	F. J. Kress Box Co.	2,745,592	"
Bag	Bemis Bro. Bag Co.	2,745,593	"
Valve bag	Universal Paper Bag Co.	2,745,594	"
Lock-top envelope	Cohoes Carrybag Co., Inc.	2,745,595	"
Paper machine reel starter	Minnesota & Ontario Paper Co.	2,745,606	"
Suction feeding mechanism	International Paper Box Machine Co.	2,745,665	"
Apparatus for pulp sampling	Minnesota & Ontario Paper Co.	2,746,297	5/22/56
Pulp molding apparatus	Keyes Fibre Co.	2,746,358	"
Appliance for use in forming separate compartments in cardboard units	R.H. Filmer Ltd.	2,746,361	"

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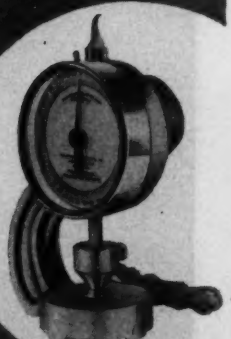

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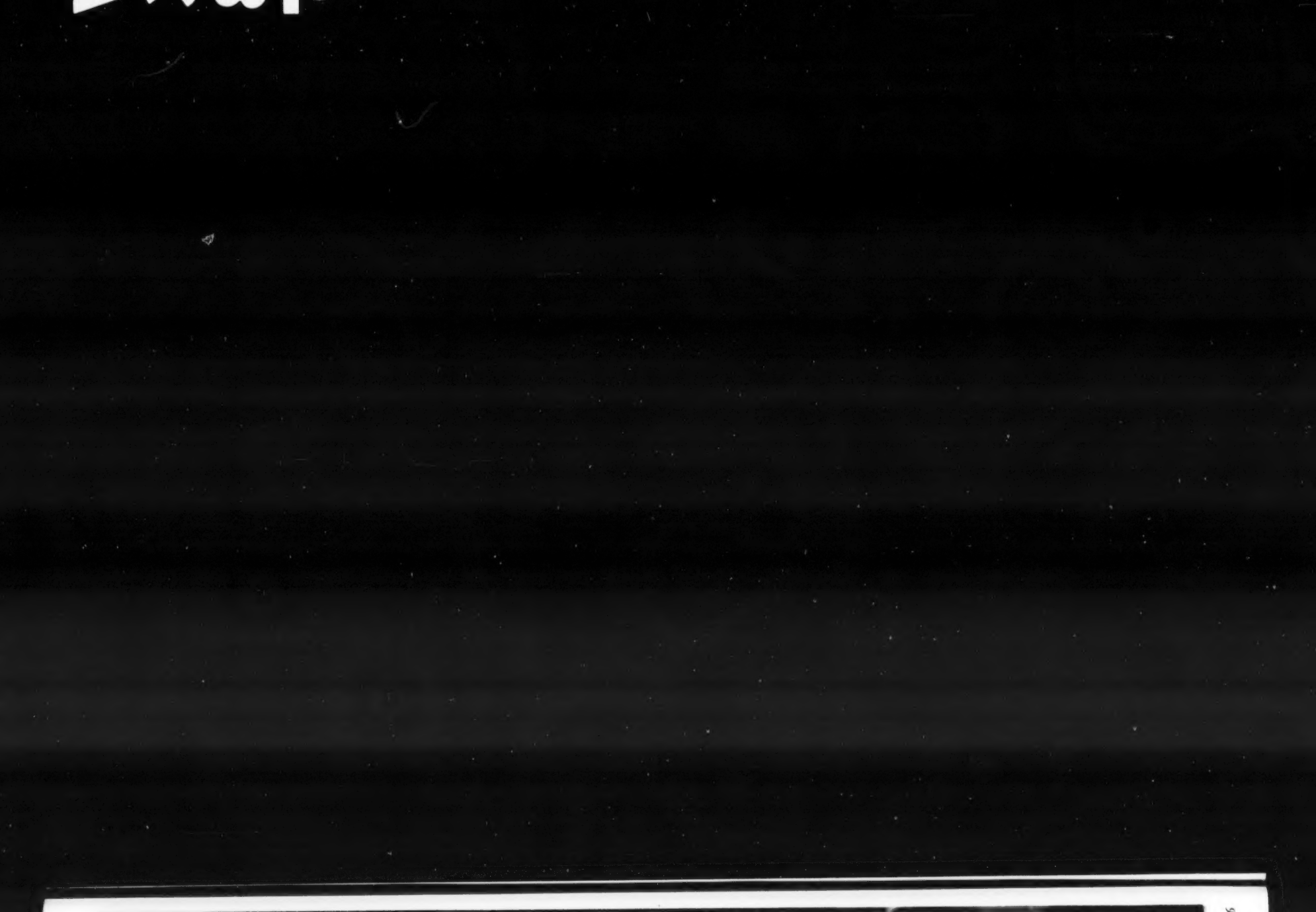

FOREIGN ABSTRACTS

Reactivity of wood celluloses

Various specimens of cellulose were examined and their reactivities were compared. They included cotton, sulfite and kraft pulps and it was shown that chemical reactivity was influenced mainly by the chain length distribution of the cellulosic material. The higher the percentage of the fractions having a degree of polymerization (D.P.) above 1200 and the lower the fraction with a D.P. below 200, the less reactive was the cellulose in question.

Evidently interchain cross linkages are of minor significance. A measure of the cross linkage was obtained from water sorption isotherms. Activation of the pulps prior to xanthation was obtained by treating the cellulic material for about 6 hours at 50° C. with dilute hydrochloric acid.

N. Y. Solechnik and A. A. Bakk. *Zhur Priklad Khim.* 29,768 (1956) (original in Russian) through *C.A.* 50, 11660 (1956).

Quantitative determination of sugars by paper chromatography

The article emanates from the Research Laboratory of Zellstofffabrik Waldhof. The author's experiments confirm those of others, that sugars separated chromatographically cannot be gaged accurately by measuring the size of the sugar spots.

A visual method for determining sugars was developed and is described in meticulous detail. Its accuracy and precision were tested, and numerous analyses are given for the sugars derived from such fibrous raw materials as wood, bamboo, flax, straw, esparto, ramie, and bagasse. Sugars derived from hemicelluloses and those found in sulfite spent liqors were also determined, and the method applies to those obtained from viscose and from alpha celluloses as well. The sugars dealt with are glucose, galactose, mannose, arabinose and xylose.

The method depends on the use of a solvent causing rapid and sharp separation of the sugars on the chromatograms. One solvent which is recommended is a mixture of pyridine-ethyl acetate-water (in the ratio of 1:2.5: 3.5, using the upper layer of the mixture). Together with unknown samples, known sugar mixtures are chromatographed simultaneously (the amounts of sugars varying from 0.2 gamma to 4 gammas). Spots were developed by spraying with aniline acid phthalate. The size and intensities of the pentose spots could be gaged by visual inspection in diffused daylight. Those of glucose, mannose and galactose were viewed under ultraviolet light, and the resulting areas encircled. Normally duplicate determinations for known sugars fell within ± 5% of the amounts taken. In unknown determinations the results usually agreed within 10%. The hemicelluloses isolated from various dissolving pulps made and bleached under similar conditions in various mill runs yielded almost identical amounts of mannose, glucose and xylose.

Twenty-one references, 8 tables, and 11 reproductions of chromatograms are given. Arnold Rentz. *Das Papier* 10, 192-200 (1956) (in German).

Wood fiberboard as a surfacing material for houses

Practical weathering tests have shown that fiberboard can be used advantageously as an external surfacing material for various types of dwellings. This has been demonstrated in various parts of Sweden even when climatic conditions are highly unfavorable. For example in Figure 1, a beach house is shown, surfaced in this

Fig. 1

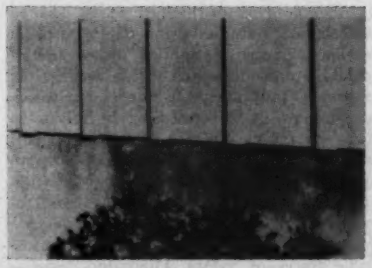

Fig. 2

way, which is free from signs of buckling despite its exposure to salt air and high humidity. In figure 2 are shown the lower edges of fiberboards exposed for about 16 years.

There is an advantage in using heat-treated boards and to turn the wire-side of the board to the outside. The sheeted boards should be moistened before they are nailed into place, and it is important to distribute the nails properly. Preferably the fiberboards should be applied to laths.

Seven typical illustrations are included. Kurt Bengtson. *Svensk Paperstidn*, 59, 377-380 (1956) (in Swedish, with a very brief English summary).

The re-moistening of sprucewood logs after storage

In order to obtain satisfactory wet-debarking, and proper manufacturing conditions in the production of mechanical pulp, it is essential that the wood have a sufficiently high water content. The results obtained by other investigators in achieving this result with partially dried wood are reviewed.

In the present study, spruce logs about 1.8 to 2 meters in length and 10-14 centimeters in diameter were stored two years, until the moisture content had dropped to 13.6 percent. These bolts were then treated under a variety of conditions involving evacuation and water treatment, and the results are shown graphically.

When the following conditions were used the water content reached a suitable level of 33-38 percent. The logs were subjected to an initial vacuum which insured that the entire system had dropped to 0.05-0.07 atmospheres. This was followed by a two hour water treatment under 10 atmospheres pressure. A drawing is given of the equipment used. The authors also determined the effects on the water up-take, of the length of the bolt and of its water content prior to treatment. The distribution of the water within the bolt was also determined.

Thirteen references, 11 figures and 1 table are given. Walter Brecht and Gunther Schuster. *Das Papier* 10, 271-81 (1956) (in German).

Pollution effects of wastes from Swedish pulp mills

Waste liquors emanating from pulp mills located on the Northern coast of Sweden and their polluting effects on stratified brackish waters were subjected to study.

The organic matter in the spent liquors follows the surface water, and in the case of mills located on the open coast, the polluting effects are reduced rapidly during the summer months. In the winter however, this reduction proceeds much more slowly, due to low temperatures and to moderate wind turbulence, and the polluted water is distributed over wide areas in a thin layer under the ice.

In certain enclosed regions (especially in the fiord areas) pollution is quite serious and the water is polluted even at greater depths. The discharge of waste liquors should be carried out in such a way that

they mix with as large a volume of sea water as possible, and without reaching too great a depth. In deep water, the waste liquor is not in sufficient contact with air. Fiber deposits reaching the bottom are largely the result of local conditions, and occur close to the point of discharge. In shallow water such fibers may be carried over wide areas.

The author's study shows that there are no indications that the herring fisheries of the Baltic Sea are adversely affected. However, secondary pollution caused by fungi, fibers, or by dead plankton (caused by plankton plague) may damage the fishing nets. Migratory fishes are influenced largely by water polluted with toxic material and by wastes that cause oxygen consumption, at the estuaries.

Future studies are planned, and these will include studies on the movements of deep water.

Ten references, 14 figures (mostly maps showing location of miles etc.) and 2 tables are given. Leif Bruneau. *Svensk Papperstidning* 59, 465-476 (1956) (in Swedish, with an English summary).

The tertiary wall in the tracheids of various spruce pulps

Sulfite and kraft pulps made from spruce may be distinguished microscopically after swelling in cubriethylene diamine by the appearence of the tertiary walls of the fibers, which are the innermost layers adjacent to the lumen. In the case of sulfite pulps this tertiary layer is largely fragmented and destroyed, as indicated by the "TW" in Figure 3. In ordinary kraft pulps however this layer remains nearly intact (as shown in Figure 4). The tertiary layer

Fig. 3

is also almost unchanged in the case of chlorite holocellulose fibers. When, however, prehydrolysis occurs, followed by sulfate pulping, the cell wall loses most of its tertiary layer, and this is also true when

Fig. 4

kraft pulp is extracted with 17.5 per cent sodium hydroxide.

The authors report various analyses on the carbohydrate composition of the different pulps, and conclude that the tertiary layer is probably made up of xylose units. The diffusion of cooking liquor through the cell walls during the sulfite and kraft cooks is discussed.

Sixteen photomicrographs, and 11 references are given. Hans Meier and Sven Yllner. *Svensk Papperstidning* 59, 395-401 (1956) (in German).

Dry- and semi-dry fiberboards; their water-soluble components

Fiberboards made by dry and semi-dry processes, and which are relatively new, appear to offer certain advantages over those made by the usual wet methods. The former are largely independent of water supplies and can be operated in conjunction with sawmills or plywood mills even in relatively arid regions. Air is used in fiber transport and as a means of sheet formation; the processes in three American mills are described briefly, and their products are compared with that obtained by the wet method.

A large part of the article is devoted to laboratory studies using paper partition chromatography as applied to the water-soluble components of boards made from sapwood and outer and inner heartwood, as well as those formed by hydrolysis in the defibrator. Water soluble components of the sapwood (extracted but not apparently hydrolyzed further by acid) included largely arabinose, significant amounts of a so-called "lignin-complex", very small amounts of galactose, and possible traces of xylose. Difibrator degradation gave rise to these same components together with glucose, and possibly traces of ribose. (However, none of these were identified by any means other than paper chromatography).

Data are also given for hydrolytic products formed when the various extracts and/or boards were more fully hydrolyzed. Under such conditions, mannose was also formed. In a wet fiberboard manufacturing process, water-soluble components are leached out; but in the dry (or semi-dry process) they remain in the board, and appear to be converted into artificial polysaccharides which form a sort of "caramel" and are deposited on the wire side of the board.

By use of chromatograms, the authors were able to tell whether a board had been made by a wet or by a dry process. When the final board still contained arabinose (or arabans hydrolyzable to arabinose) a wet process had *not* been used in their manufacture. Wilhelm Sandermann and Otto Künnemeyer. *Das Papier* 10, 287-94 (1956). (in German). (with brief English summary).

Finely divided wood; lignin extraction with neutral solvents

The author reviews previous methods used in attempting to extract lignin and cellulose from wood, ground in various ways, as well as a number of methods used in isolating "native lignin." Possible methods of distintegrating wood and suitable solvents for removing lignin are discussed.

Using sprucewood, the author found that by grinding wood in a non-swelling liquid, in a vibrational ball mill (of the U.S. Bureau of Standards type) it was possible to extract 50 per cent or more of the total lignin. The charge in the mill however must be small. The wood is first reduced to pass a 20 mesh screen, pre-extracted to remove resins dried in air and then *in vacuo* over phosphorus pentoxide, and then ground 48 hrs. in a Lampen mill (using a 12 gram charge) and 48 hrs. in the vibrational mill (using a 6 gram charge). Toluene was used as the dispersing agent, and was subsequently removed by centrifuging. The wood was then dispersed in dioxane containing about 4 per cent water, the solvent evaporated *in vacuo*, the residual lignin dissolved in aqueous acetic acid, precipitated into water, dried, dissolved in a mixture of 2 parts ethylene dichloride and 1 part ethanol, precipitated into ethyl ether, washed with this solvent, and with low-boiling petroleum ether, and dried in moisture-free air, and finally *in vacuo* over phosphorus pentoxide and paraffin.

Obtained in this way the "milled wood lignin" was faintly cream-colored, ash free, and had a weight average molecular weight of about 11000. Small amounts of sugar units still contaminate this lignin; these sugar units are the same as those found in sprucewood hemicellulose. Determinations of the phenolic hydroxyl groups in the lignin and ultraviolet absorption studies indicate that the structure of this milled lignin is similar to lignin isolated under mild conditions from wood by other means. The relative amount of p-hydroxybenzyl alcohol groups, shows that the milled wood lignin contains about one half of the amount present in "Brauns native lignin," and about twice the amount present in the original wood meal. The milled wood lignin should prove a very useful material for futher studies by lignin chemists. Six figures and 40 references are given.

Anders Bjorkman. *Svensk Papperstidning* 59, 477-485 (1956) (in English).

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The one certain way of getting absolutely uniform quality starches for your better papers is by using Hercules starches. One batch of any specific type of Hercules starch is precisely identical with every other batch of the same type. The reason for the perfect quality control is that production of Hercules brand corn starch is under 100% automatic instrument control in an exclusive, new process. Results are precise and your starch requirements are met exactly.

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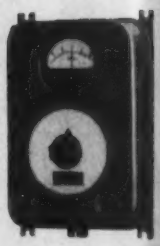
CONTINUOUS, ACCURATE basis weight control system provides cross-sheet measurement. Rays from nuclear source measure exact weight without touching paper . . . assure uniform production by charting weight variations for machine tenders or adjusting wet end controls.



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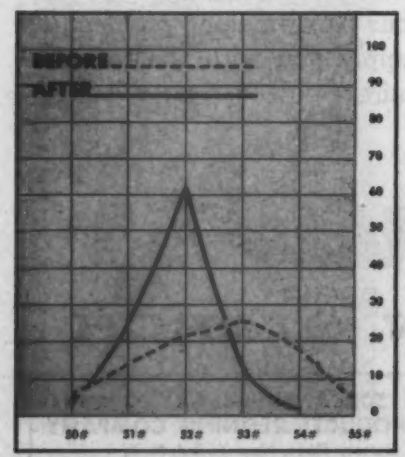

BEFORE, when hand-weighted test sheets are used for control, weights vary greatly. **AFTER** installation of Curtiss-Wright System, uniformity sharply increases.

With Curtiss-Wright Basis Weight Control Systems installed on both wet and dry ends, it is possible to increase production on specification as much as 30% by reducing weight variations in both the machine and profile directions.

Also, wet and dry end measurement permits accurate settings on all moisture extraction equipment – assuring the sheet will enter the driers in the driest possible condition. Machine speed may be increased or steam requirements lowered.

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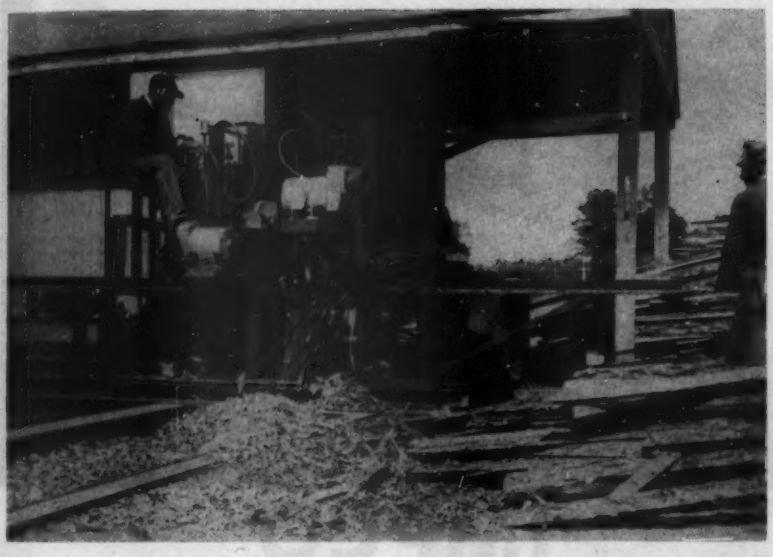


These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

11/ Use readers' service card.

Bark remover

This new slab barker has been designed to remove bark by a scraping method rather than by flailing. This method results in removing the bark cleanly without splintering or bruising the wood.

The machine is equipped with three barking heads, each of which can be hydraulically adjusted by the operator to fit the contour of the slab. Each head is equipped with scraper knives which travel across the slab. The first head removes the bark from the top of the slab, while the other two clean it from the sides. Slabs are fed into the barker by grooved rolls and removed by a conveyor. Maximum slab size is 16 in. wide and 7 in. thick, and any slab over 5 ft. in length can be put through the barker.

Although, originally developed for use on southern pine, the machine has been found very successful in use on spruce and balsam. *Carthage Machine Co.*

12/ Use readers' service card.

Flexible control systems

Process plants are now making control systems flexible, reducing parts stock, and simplifying personnel training through a new method of instrumentation. Users select from a line of standardized, multi-purpose instruments to build their own special-purpose systems.

"Building block method" is the term announced by Bailey Meter Co. for its new line of multi-purpose instruments and controls. *Bailey Meter Co.*

13/ Use readers' service card.

Heavy duty embosser

Whether you require cold embossing or hot, light nip pressures or heavy, deep impressions or smooth calendering, you will be interested in the performance of the newly designed Dilts heavy duty embosser.

Among the advantages offered by this equipment is the compactness and extreme versatility in method of operation. *Black-Clawson Co.*

14/ Use readers' service card.

Industrial hammermill

A new type hammermill has been designed to handle a wide range of grinding. The secret of the wide range of adjustment is the hammer arrangement. There are two rows of holes in circles on the rotor plates. By placing hammers on the outside row, there is increased hammer tip speed and reduced clearance between the screen and the hammers, thus providing for very fine or finish grinding.

For coarser grinds, fewer but larger hammers are used, and these are attached with pins, to the inside row of holes. This gives slower tip speed, greater clearance, and fewer impact points thus, producing large, uniform particles. *Myers-Sherman Co.*

15/ Use readers' service card.

A-C polyethylene

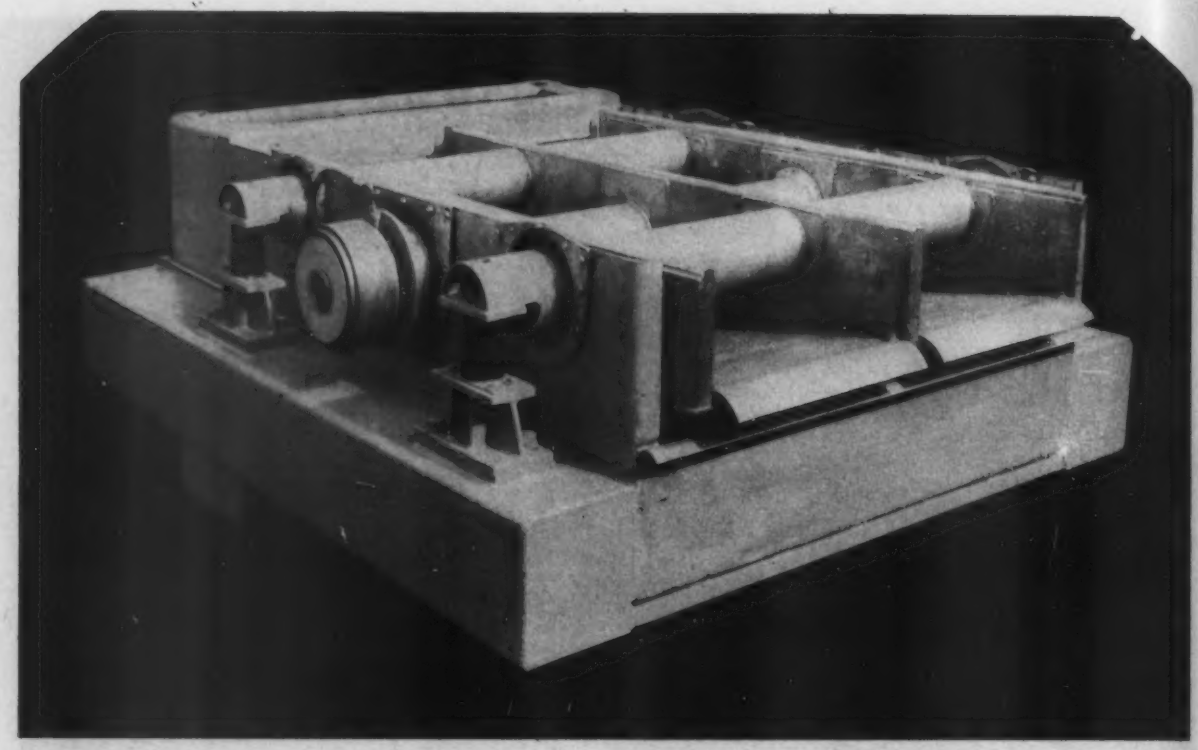
Research has proved that the use of A-C polyethylene eliminated scuff-off and scratch, to the extent that cut paper linings and other types of wadding and batting were not necessary for the packing of furniture and similar items.

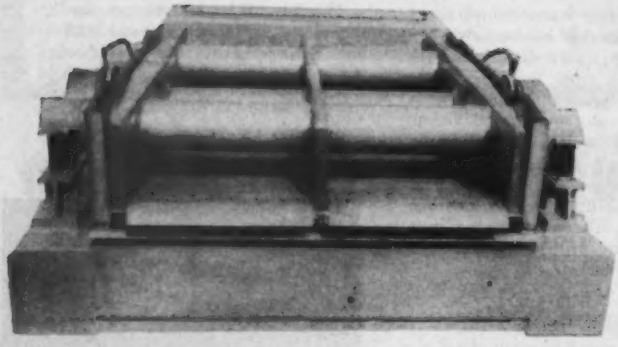
The advantages of this coating lies in the plastic-like toughness and scuff resistant characteristics. The introduction of A-C polyethylene into wax helps hold the coating on the surface. *Allied Chemical Corp.*

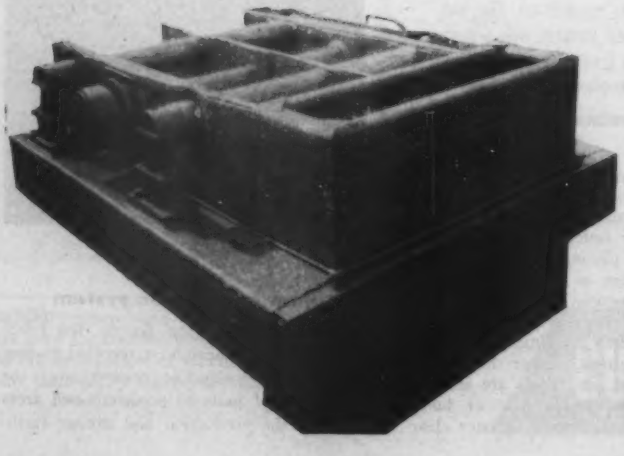
16/ Use readers' service card.

Automatic conveyor system

This new conveying system, the result of many years research, is reported to provide automatic-selective control over the movement of parts to predetermined areas through the production and storage facili-







IMPCO VIBRATORY KNOTTER

Here is a unit which contains several new features never before incorporated in knotters. Double wall construction of the stainless vat and center section guarantees extra long basket life. Rubber mounts support the vibrating basket as well as the vat itself, eliminating old-fashioned springs as well as minimizing vibration transmission to the building members. The built-in inlet box lends itself to subfloor piping as does the discharge. Six sectionalized screen plates are advantageous in that plate changes for various fibre clarifications are easily made. Oil mist lubrication, proper seals, and flinger rings protect the antifriction bearings against water, cooking liquors, and hot vapors.

Largest plate area is in keeping with present day peak capacities.

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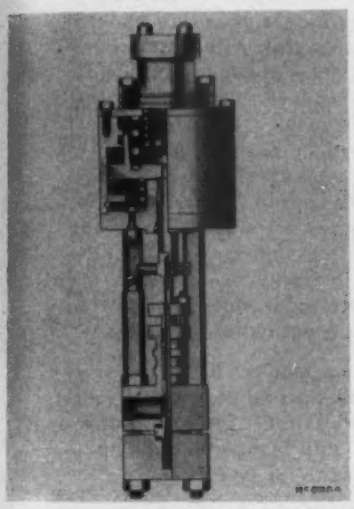
ties of an entire plant. Component parts may now be automatically supplied to each work station as they are needed from individual storage banks or lines.

Called the "Twin-Trak" system, this system can be combined with present R-W "Zig-Zag" conveyor. *Richards-Wilcox Mfg. Co.*

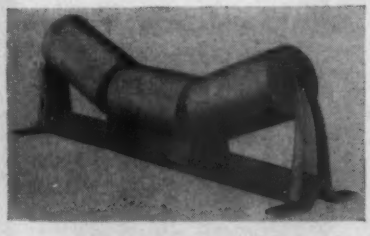


17/ Use readers' service card.

Small flow control valve

A valve for working pressures to 6,000 psi, which will provide industry with an extremely high-speed and responsive small flow control valve, has been designed.

Known as model 9460, the valve features use of Annin's 600 series differential area Domotor operator. The differential area piston eliminates need for loading regulator and will stroke fully in either direction in 0.75 sec. or less. *Annin Co.*



18/ Use readers' service card.

Conveyor idler

A new series of ball bearing conveyor idlers is available in both a greaseless type, with a "one shot" lubrication system serving all three rolls at once, and a factory sealed type, which requires no further greasing. The idler rolls consist of a smooth, uniformly thick outer shell plus a heavy-wall steel center tube. These tubes are brazed to dish-shaped steel heads, forming a strong, moisture-tight integral unit.

The idlers are available for seven belt widths from 14 to 36 in. *Link-Belt Co.*

19/ Use readers' service card.

Markers for pipe identification

When pipe repairs must be made, the "down-time" on maintenance can be cut to a low by the use of an identification system.

This identification system can be set up in the mill by using Perma-Code markers introduced by the Brady Co.

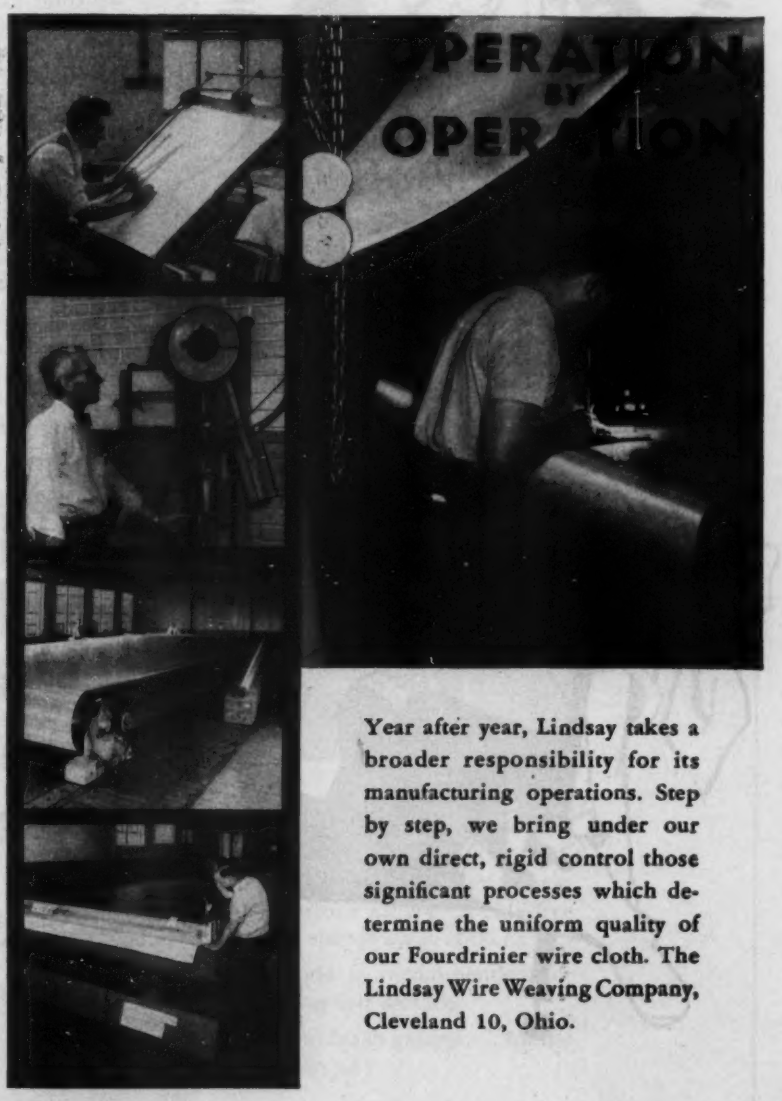
These markers, in form of arrows and labels, are applied directly to the pipes. Maintenance engineers can quickly identify pipes by using this coding method.

The company will supply a free kit which includes: samples, planning guide, cost comparison, stock list, and application photos. *The Brady Co.*

20/ Use readers' service card.

Dryer drainage system

This Cram balanced differential dryer drainage system, is a new blow-through system for draining dryers uniformly and economically. The system can be installed



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It all adds up to money in the bank for you . . . and the dozens of leading mills that depend on Hurletrons. See one in operation. We'll be glad to give you the name of a Hurletron user near you.

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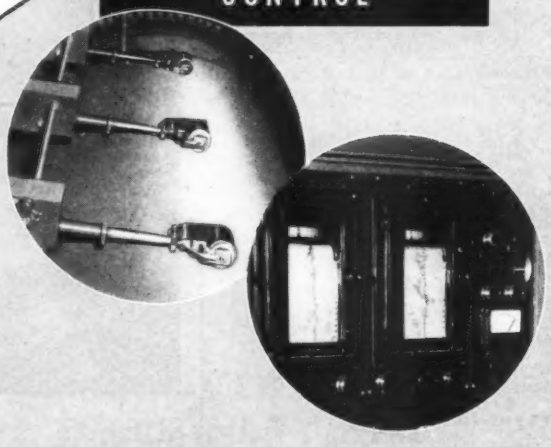

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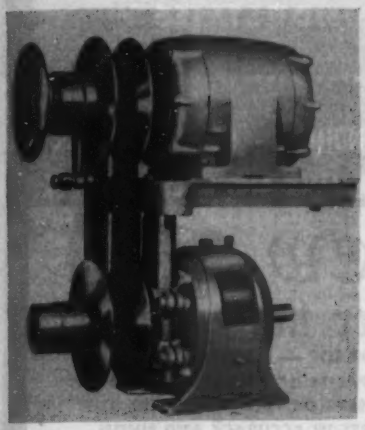
on any type of paper or pulp drying machine, and can be used for any grade of paper from the lightest tissue to the heaviest board.

Since the new system is a blow-through type, all condensate and air are continuously removed from the dryers. This increases the effective drying area of the dryers. *Appleton Machine Co.*

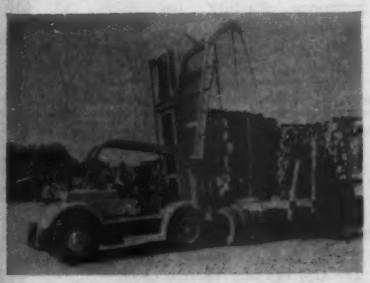


21/ Use readers' service card.

Variable speed drive units

Called Vari-mount, these units feature standard interchangeable components and are designed to accommodate standard motors. Capacities range from one to 15 hp with maximum speeds of 711 to 15.1 rpm and minimum speeds from 355 to 2.5 rpm. Speed adjustment ranges are available up to 6:1.

These units are available in vertical or horizontal models and can be operated by remote or manual control. *Foote Bros.*



22/ Use readers' service card.

Pulpwood loaders

Four new pulpwood loader models have been announced for the handling of pulpwood in storage yards, and for loading and unloading road trucks and rail rack cars.

New features include larger, stronger uprights, power brakes as standard equipment, tandem hydraulic pumps and tank strainers and a stronger hydraulic trip mechanism. A wide sling spacing is also featured to prevent load distortion on drop. *Hyster Co.*

23/ Use readers' service card.

Industrial belting

Extremultus, a new industrial belting, is proving its manufacturer's flat guarantee that it will outperform any existing belting as much as 3 to 1.

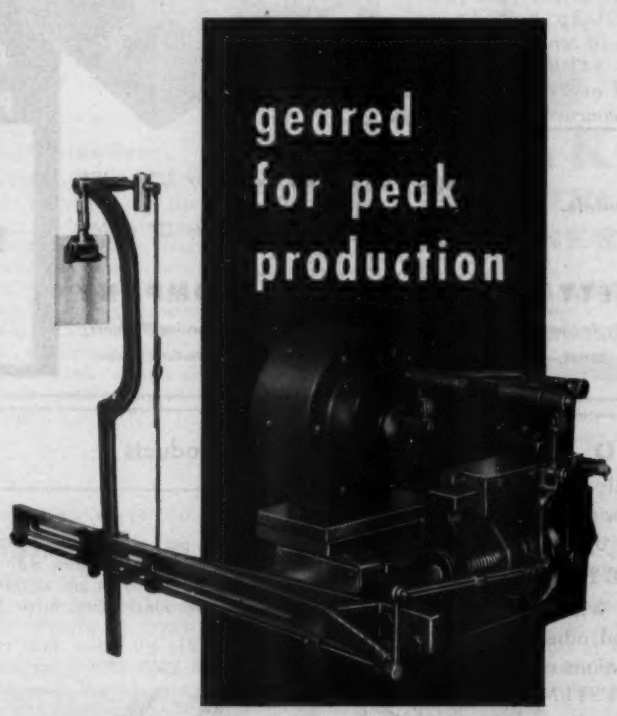
Extremultus is thinner, lighter and usually one-third the width of the leather belt it replaces. The normal rated speed of the belt is 9,000 ft. per minute, but has operated at 20,000 ft. per minute.

Test orders are solicited with the understanding that the belt may be cut off and returned for full credit if it does not prove superior in every way. *Extremultus, Inc.*

24/ Use readers' service card.

Conveyor belt

Made with five plies of the new "Nyfil 120-RS" fabric, this new nylon-filled fabric, provides the muscle for a conveyor belt. According to the company, this fabric is as strong as a steel cord belt rated at 1,000



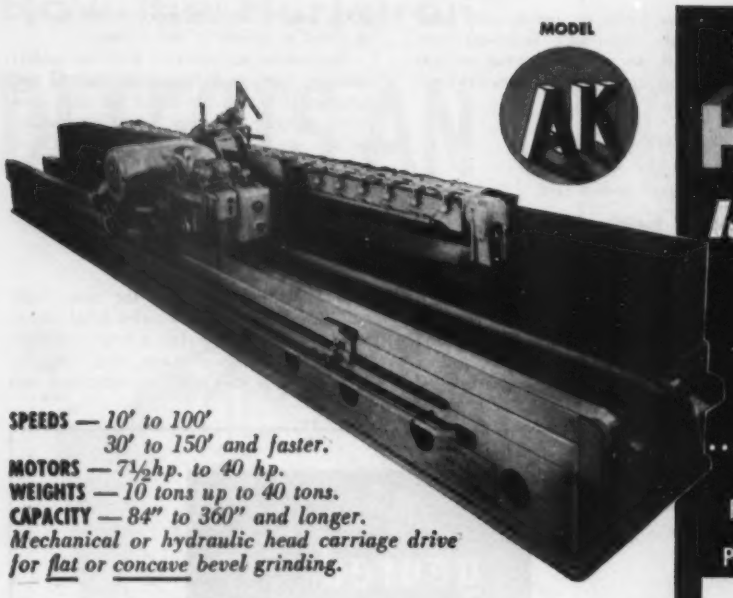
This Gilbert and Nash Model 434 guide is geared for today's high-speed production requirements. A sealed planetary reduction gear and anti-friction bearings *assure* trouble-free operation at machine speeds *up to 3000 f.p.m.!*

This low-contour guide is recommended for wire, wet felt and dryer felt service.

And like all Gilbert and Nash guides . . . Model 434 is *engineered for the job!*

GILBERT and NASH company

*Manufactured and sold exclusively by The Appleton Machine Company



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SPEEDS — *10' to 100'*
30' to 150' and faster.
MOTORS — *7½hp. to 40 hp.*
WEIGHTS — *10 tons up to 40 tons.*
CAPACITY — *84" to 360" and longer.*
Mechanical or hydraulic head carriage drive for flat or concave bevel grinding.

Other Models.

— **medium heavy duty** — *capacity 32" to 184"*

— **normal production** — *capacity 32" to 108"*

NEW MODEL SK-24

slitter knife grinder

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CAPACITY 3" TO 24" DIAMETER
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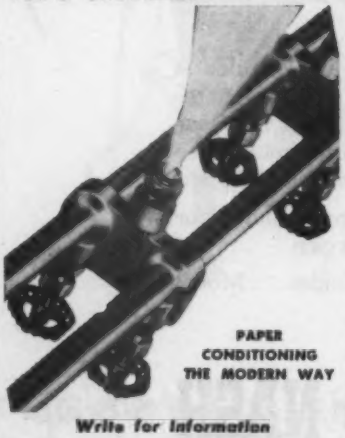

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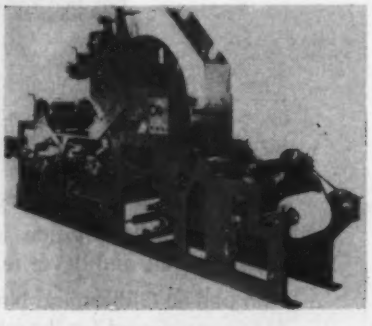
lb. per inch per ply. These belts are available for all industrial uses with both light and high tension at no increase in cost over conventional fabric belts. *B. F. Goodrich.*



25/ Use readers' service card.

Three-color flexographic press

The Inta-Roto Machine Co. Inc. has completed a three-color drum type flexographic printing press especially designed for use with pressure sensitive tapes and other materials which require support for multicolor printing. This press is a drum type unit for 10-in. wide printing and has certain flexibility built into it which permits a wide variety of printing, perforating and slitting operations. An endless variety of thread-ups and combinations can be worked out from this versatile machine. The machine is complete with motor drive and has heated drying system. *The Inta-Roto Machine Co. Inc.*

26/ Use readers' service card.

New bottomer machine

Manufactured in West Germany, a new bottomer machine for flush cut and stepped-end tubes up to 6 ply, will produce single or double pasted bottom multiwall sacks in one operation.

The machine can be used to produce any desired glued paper sacks from tubes and will convert tubes of a wide variety of papers including Kraft, light crepe, asphalt, foil lines, etc. *Potdevin Machine Co.*

27/ Use readers' service card.

Small whole log debarker

The "Beaver", a log debarker, is a complete self-contained unit with a frame of heavy structural steel. Thus, it does not require a foundation of concrete and steel to assure suitable operation.

When the log is rolled into the machine, it is revolved by 6- or 8- fluted roller wheels. The scraper head is forced against

the log by the operator. Once the log is debarked, it is kicked out either by manual means or by a mechanical log kicker. *Jackson Industries, Inc.*

28/ Use readers' service card.

Magnet thickness gage

The new thickness gage is designed for non-destructive thickness measurements of non-magnetic materials—plastic, celluloid, mica and paper—can also be measured when placed on a smooth, magnetic plate. The PM thickness gage assures high quality finishes and uniform films. Measurements are made from the coated side of the material.

The gage also measures coatings on external, internal or compound cylindrical surfaces—provided it is calibrated on a sample of the base material of the same shape and composition. *General Electric.*

29/ Use readers' service card.

Proportioning and metering system

ATI proportioning and metering system is designed to provide an overall accuracy of 2 per cent plus or minus over range of flow from 100 per cent to 10 per cent of rated capacity for equipment used.

The ATI proportioner can be used to maintain chemical feed in proportion to flow and affords a measurement of flow on the linear scale.

The electrically-operated ATI meter either records, indicates or totalizes the flow, or combines any two or all three functions. Also the meter case may be mounted on wall. *Infilco Inc.*

30/ Use readers' service card.

Recorder for draw-speed

The development of a new electronic recording system to measure and continuously record the draw-speed on a paper machine, enables the mill superintendent or machine operator to set up a standard acceptable draw-speed and maintain it at all times, thus improving the uniformity of the web. Also, it is helpful in eliminating breaks.

Installation experience has shown that its cost is less than 1½ hrs. of machine time production in most cases. *Bristol Co.*

31/ Use readers' service card.

Viscosity stabilizer

Announcement of a new viscosity stabilizer has been made. Known as MNI Stabilizer No. 822, it is reported to reduce "free water" in starch formula adhesives for corrugated box manufacturing and is used to maintain proper viscosity despite agitation, pumping, circulation, temperature change and starch variations.

It is supplied in easy-to-mix powdered form and costs considerably less than previously suitable products. *Morningstar, Nicol Inc.*

32/ Use readers' service card.

Paste-type defoamer

De-Airex 527 is a new paste-type defoamer developed for use in paper mills.

This defoamer is highly effective in alkaline stock where the pH is above 7.0. It mixes readily with water under agitation and its foam control properties are not hindered by freezing.

It has proven efficient under pH conditions as high as 11 and 12, such as caused by caustic soda used in deinking. It is also excellent in kraft pulp mills, in the thickening and screening of unbleached stock. *E. F. Houghton & Co.*

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33/ Use readers' service card.

Safety valve test stand

The safety valve test stand is a unit which can be used for the regular setting and checking of all types of safety valves from ¼ in. screwed to 4 in. flanged.

These units, supplied in many models, give accurate readings for pressures between 1000 pds. and others ranging up to 10,000 pds.—depending upon the model. *Industrial Engineering Corp.*

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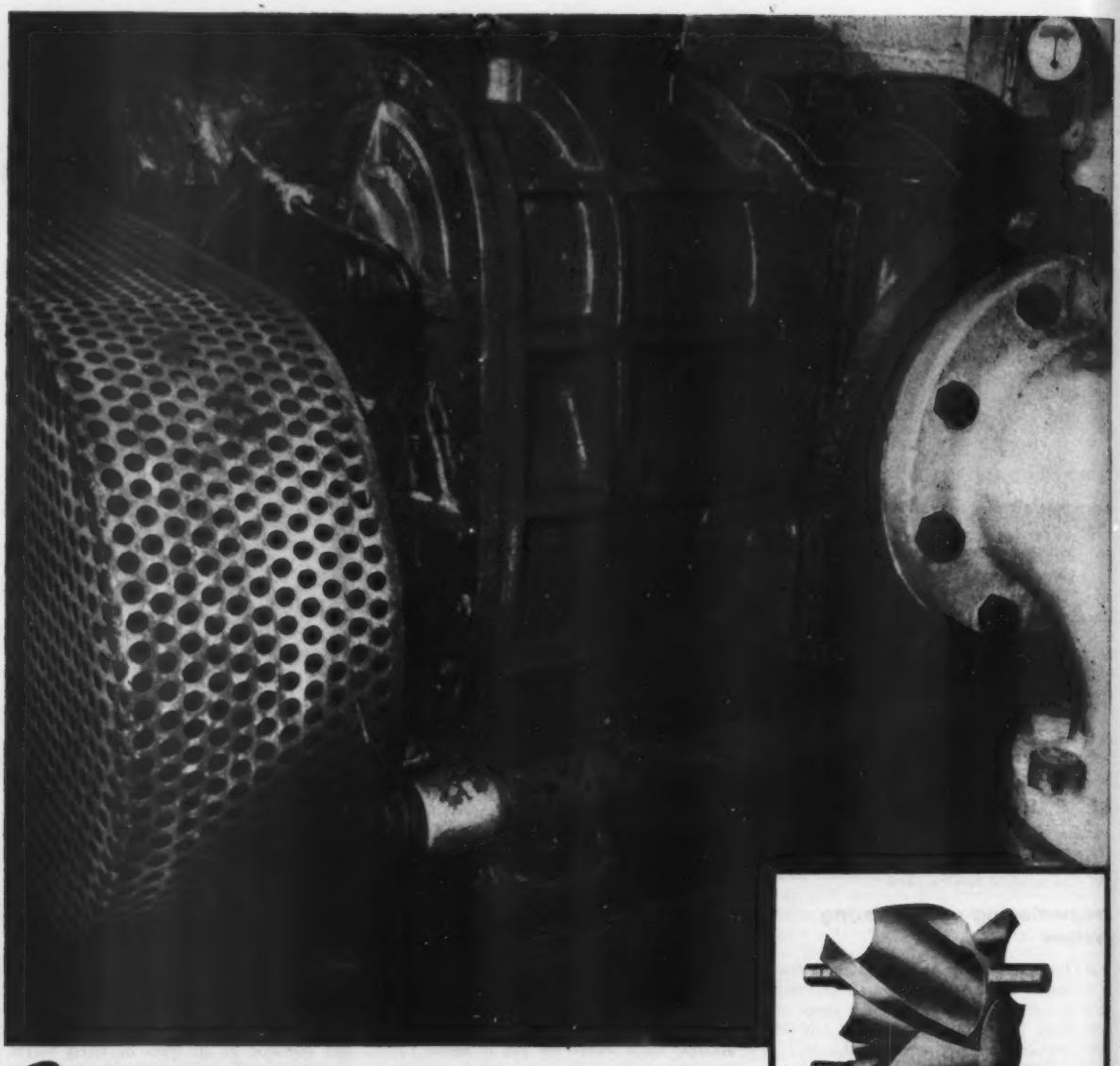


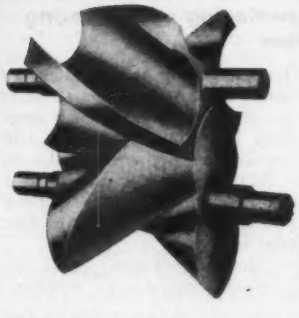
Standardaire pump solves drying and foaming problems . . . cuts maintenance for specialty paper producer

Uneven drying and heavy foaming problems resulting from vacuum fluctuations presented serious obstacles to Raybestos-Manhattan, Inc., in the production of its new, single-fiber asbestos paper.

A Standardaire vacuum pump, installed originally on a 4-month trial basis, entirely eliminated these difficulties. The unit, requiring only half of the area of the former pump, provided a constant vacuum, making possible an uninterrupted flow between the pulp vat and the final windup drum.

Now, after nearly four years of operation, often in excess of rated capacity, this unit still is in prime condition. No maintenance has been required other than lubrication at 3-month intervals.

The compact Standardaire offers greater capacity per pound of pump, with less power consumption, than other units of equal size and weight. Find out how they can help solve your problems. Write for your copy of illustrated bulletin B-154 which provides specifications and operating data.



The Standardaire's even vacuum and high capacity are the result of its exclusive cycloidal, screw-type rotors which compress air in a wide range of pressures with a minimum of internal leakage. Since rotors never touch, there is no friction, no wear or need for internal lubrication.

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NEW LITERATURE

Books

GUIDE TO FILMS, PERIODICALS, AND BOOKS IN PRINTING, PAPER, PUBLISHING, PRINTED ADVERTISING, AND THEIR CLOSELY RELATED INDUSTRIES. By Prof. George J. Mills. School of Printing Management: Carnegie Institute of Technology, Pittsburgh. 7 x 10½. 64 pages. paperbound. $2.00.

Dr. Mills has written this book as a result of constant requests for information at the School of Printing Management from persons working in all phases of the graphic arts industry and many of the related industries, such as paper, printed advestising, publishing and commercial photograhy.

Since the graphic arts field is subject to continuing techonological change, emphasis is primarily in the most recently issued sources.

The book may be ordered from Prof. George J. Mills at the School of Printing Management, Carnegie Institute of Technology, Pittsburgh 13, Pa.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

34/Use readers' service card.

Chemical Mixers and Feeders. Infilco Inc. An 8-page brochure, with numerous illustrations, diagrams, descriptions and performance data on the Infilco mixers and feeders.

35/Use readers' service card.

Neusol Feeder. Infilco Inc. A bulletin on chemical feeding equipment for use in the treatment of waters and wastes. The bulletin includes illustrations and diagrams of this equipment.

36/Use readers' service card.

Steam Condenser Catalog. Condenser Service & Engineering Co. Inc. A catalog containing the recent additions of condensers manufactured by the company. Catalog shows photos of actual installations along with description and charts. There is also a section devoted to the engineering facts about the condensers.

37/Use readers' service card.

Variable Speed Motor Pulleys. Worthington Corp. A new bulletin on variable speed motor pulleys features motor pulleys (⅛ through ¾ hp). The bulletin is graphically illustrated by numerous charts that list complete ratings, dimensions and selection data for the various variable speed motor pulleys.

38/Use readers' service card.

Ferro Inorganic Pigments. Ferro Corp. A new color chart folder which illustrates the colors of inorganic pigments manufactured by Ferro. The chart folder gives data and specifications concerning the various inorganic colors such as: specific gravity, bulk density fineness residue on 325 mesh screen, oil absorption and composition. Sample of these color pigments are also available upon request.

39/Use readers' service card.

Pan-A-Trol. General Electric Co. A bulletin giving application information on the GE Pan-A-Trol packaged control units for machines. It lists special installation, maintenance, and field service offered by the company. The bulletin also gives case history of how factory engineers meet the special requirements of the customers.

40/Use readers' service card.

Guide to Specifications and Applications of Tubular Products, Fittings and Flanges. Babcock & Wilcox Co. The problem of determining the proper specifications to apply to various carbon, alloy and stainless steel tubing, pipe, seamless welding fittings and flanges, is answered in a new 4-page folder published by the company.

41/Use readers' service card.

Typical Data On Handling and Storage of Paper Clays. Minerals & Chemicals Corp. of America. This technical bulletin presents in tabular and text form, valuable information for papermakers on bulk handling of clays. Objective is to help reduce materials handling cost in the paper mill.

42/Use readers' service card.

Low-Cost Variable Speed. Reeves Pulley Co. A catalog describing all of the improved design features for the No. 800 series Reeves Jr. motor pulleys. This series is available in hp capacities from ¼ hp to 1½ hp and in speed ratios up to 2.75:1.

43/Use readers' service card.

Disintegrators and Mastigrators. Rietz Mfg. Co. Two bulletins published. No. R-507 deals with the applications of various models of disintegrators to fine or coarse disintegrations. No. P-508 discusses the applications of different models of prebreakers and mastigrators.

44/Use readers' service card.

Digesters. Bauer Bros. Co. Two bulletins describing the company's digesters. One describes the Grenco continuous digester with illustrations and diagrams of operation. The other describes the rapid cycle digesters. This is also shown with illustrations and diagrams of operation.

45/Use readers' service card.

The Story of Eight Machines. Pusey & Jones Corp. A 16-page folder giving installation stories in connection with the start-up of each new machine. Illustrations include the fourdrinier and cylinder machines and detailed lists of machine features.

46/Use readers' service card.

Motors. U. S. Electrical Motors Inc. In this revamped bulletin: a more complete line of U. S. motors, descriptions and full-color illustrations that include open-type uniclosed designs, totally-enclosed and explosion-proof types, varidrives, syncrogears, and right-angle worm gear models; also vertical motors and verticlosed hollowshaft types.

47/Use readers' service card.

For Pumps Handling Paper Stock Suspensions. Gould Pumps Inc. A new applications data bulletin which describes the friction of paper stock suspensions in pipes. It is based on a correlation by the University of Maine from the data by Brecht and Heller of the Technical College, Darmstadt, Germany. The bulletin also gives pump selection data for pumps handling paper stock suspensions, and also a section in the use of filters and additives to paper stock.

48/Use readers' service card.

YC Electric Arch. R. G. LeTourneau Inc. A two-color descriptive circular, setting forth complete specifications on the company's new Series YC Electric logging Arch. Included, is information such as: capacity, overall dimensions, ground clearance, turning radius etc. Specifications also are presented in detail, as well as many operating features.

49/Use readers' service card.

Chlorine Handling Equipment. Wallace & Tiernan Inc. Literature describing equipment used by industry for handling liquid and gaseous chlorine. It describes and illustrates such chlorine handling equipment as: liquid chlorine evaporators, valves and fittings for chlorine liquid and gas supply lines, manual and pilot operated chlorine pressure reducing valves and chlorine gas metering equipment.

50/Use readers' service card.

Velan Valves. Velan Engineering Ltd. A catalogue featuring the complete line of Velan bonnetless valves. Also describes, with illustrations and copy, the use and advantages of each valve and how to specify when ordering.

51/Use readers' service card.

Air Control Valves. Airmatic Valve Inc. A 72-page catalog illustrating its entire line of 2-way, 3-way and 4-way control valves for high-pressure or low-pressure installations. In the catalog, each type valve, cylinder and strainer, is handled separately. Helpful information on features, and applications are also included.

52/Use readers' service card.

Read All About It. Canadian Pulp & Paper Association. A booklet designed for widespread distribution to students and others who want a concise review of the Canadian paper and pulp industry's operations.

53/Use readers' service card.

"Pulp-Through" Refiners. Bauer Bros. Co. A bulletin describing the company's refiners. It includes: design features, operation, application and a brief history of the company's line.

54/Use readers' service card.

Alloy Steel Tubing. Babcock & Wilcox Co. Technical information on 12 of the most widely used "4100 series" of alloy steels is presented in a four-page folder. Included in the folder is: condensed data on carburizing and thermal treatments, critical points, mechanical properties and suggestions on welding and machining of these steels.

55/Use readers' service card.

Pulp Stock Valves. Crane Co. has published a new booklet describing its two lines of pulp stock valves. It also gives reasons why these valves mean better stock control in the mill, with lower-cost maintenance. The booklet also gives complete sizes, dimensions, and materials specifications for both of the Crane lines of pulp stock valves. Also includes a chart showing suggested stock valve selections for each stage of pulp or paper production.

56/Use readers' service card.

Houghton Products for Paper Mills. E. F. Houghton & Co. Foam, its causes and how to control it, are featured in this 12-page booklet. For paper mills, there is data on felt cleaning,

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New Literature . . .

removal of pitch from fourdrinier wires, cleaning and protecting metal surfaces, and lubrication recommendations for paper mill machinery.

57/Use readers' service card.

Liquid Level Indicator. Yarnall-Waring Co. A folder giving complete information on the Yarway liquid level indicator. Also gives suggestions on hook-ups for the level.

58/Use readers' service card.

Speed Drives. Worthington Corp. A booklet containing information on operating principles, design, component parts, engineering terms and formulas includes selection tables and graphic illustrations of drive dimensions.

59/Use readers' service card.

V-Belt Trouble Savers. Worthington Corp. Two easy-to-read self-mailers, intended to help users of V-Belt drives, diagnose many of the common causes of trouble in their drives. Drawings illustrate each trouble-saving tip.

60/Use readers' service card.

Bauer Processing Equipment. Bauer Bros. Co. This bulletin, No. 56, gives the complete line of processing equipment manufactured by Bauer Bros. Co. The bulletin gives only highlighted features, but gives reference for more detailed information.

61/Use readers' service card.

Prepackaging of fresh fruits and vegetables. Folding Paper Box Association. This is a 17-page report which highlights the demands for prepackaging of fresh fruits and vegetables. It gives survey reports of past and what is expected in the future on this problem.

62/Use readers' service card.

Bailey product specifications. Bailey Meter Co. A 16-page product specification booklet covering the complete line of Bailey Meter products. It gives complete descriptive illustrations, diagrams and other detailed information.

63/Use readers' service card.

Fawick Products and Services. Fawick Corp. A new 36-page book describing the products and services of Fawick Airflex Division. It includes history, applications and design data on: clutches, brakes, quick release valves and all other products.

64/Use readers' service card.

Level-Trol. Fisher Governor Co. A 32-page bulletin describing the pneumatic level controller called Level-Trol. The bulletin describes the principle of operation of the displacement type float, as well as illustrating the construction available for the many applications that can use the Level-Trol.

65/Use readers' service card.

Interlocked Armor Cable. General Electric Co. This publication covers the interlocked armor cable that is designed specifically for primary and secondary feeders in industrial power distribution systems and for generator leads, station auxiliaries, and station control cables in electric power stations. Complete product listing, including the components needed for a complete system are included in the book along with installation information and installation costs.

66/Use readers' service card.

Centrifugal Stock Pumps. Sandy Hill Iron & Brass Works. A leaflet directing your attention to the many important features of design and performance of the company's pumps.

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Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Maryland.

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WANTED

Mechanical and structural design engineers and draftsman for plant layout work and automatic equipment. Work involves board work and some field work. Experience in pulp or paper mill helpful but not essential. Location Mississippi. Good opportunity for desirable applicants. Give experience and salary range with application to Box 638, The Paper Industry.

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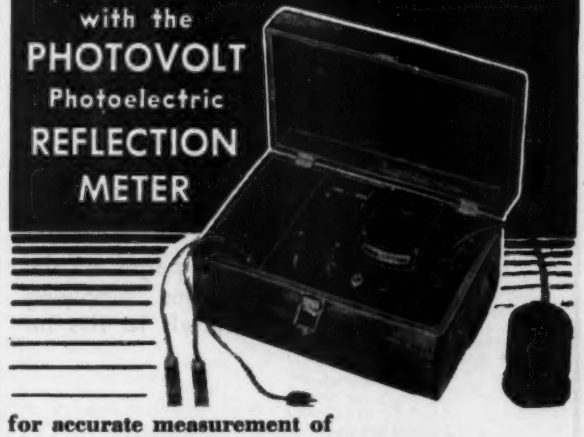

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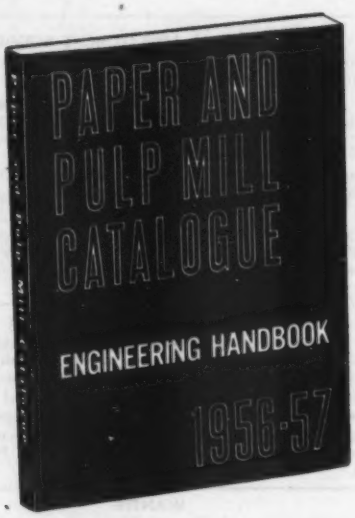

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MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.50—	14.00
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.35
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	3.00—	3.50
Blue overall cuttings	7.00—	7.50
Blue cheviots	7.00—	7.50
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.25—	5.75
American linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.	
No. 1 roofing (Chicago)	1.20—	1.25
No. 2 roofing (Chicago)	.80—	.85
Twos and blues, repacked	2.00—	2.25
Thirds and blues, repacked	—	
No. 1 whites, repacked	—	
No. 1 whites, miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	5.75—	6.25
Gunny No. 1, foreign	5.75—	6.25
No. 1 manila rope, domestic	7.75—	8.25
No. 1 manila rope, foreign	6.25—	6.50
New burlap cuts	5.50—	6.00
Sisal strings	4.25—	4.50
Mixed strings	1.50—	1.75

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—	115.00
No. 1 hard white shavings	85.00—	90.00
No. 1 soft white shavings	55.00—	60.00
Soft white shavings, uncoated	60.00—	70.00
Fly leaf shavings No. 1	28.00—	33.00
Fly leaf, woody, No. 1	35.00—	40.00
Mixed colored shavings	18.00—	23.00
No. 1 books and magazines	17.00—	18.00
Ledger stock, white, No. 1	50.00—	55.00
Ledger stock, colored, No. 1 (Midwest ship)	35.00—	40.00
New manila envelope cuttings (free of groundwood)	75.00—	80.00
New manila envelope cuttings (containing groundwood)	55.00—	60.00
Manila tab cards	75.00—	80.00
Colored tab cards	50.00—	60.00
New all-kraft envelope cuttings	70.00—	75.00
Triple sorted kraft, 100%	35.00—	40.00
No. 1 old kraft	30.00—	
White news cuts, No. 1	75.00—	80.00
No. 1 overissue news	18.00—	19.00
Folded news, special	16.00—	17.00
Folded news, ordinary	13.00—	14.00
Old corrugated boxes	20.00—	
New jute corrugated cuts	24.00—	25.00
Mill wrappers	18.00—	20.00
Boxboard cuttings	8.00—	
No. 1 mixed paper	11.00—	

CHEMICALS

F.o.b. New York City

Alum, ammonium		
Granular, bags, works, cwt.	4.30—	
Lump, drums, works, cwt	5.05—	
Powdered, drums, works, cwt	5.20—	
1-Arginine, drums, kilo	74.80—	
Blanc Fixe		
Direct process, bags, c.l., works, ton	110.00—	
L. c. l., works, ton	120.00—	
Bleaching Powder, drums, cwt		
Casein, domestic acid precipitated		
Standard, bags, 10,000-lb. lots or more, shipping point, lb	.32—	Nom.
Premium, bags, 10,000-lb. lots or more, shipping point, lb.	.38—	Nom.
China Clay, domestic dry-ground, airfloat, 99%		
325-mesh, bags, c. l., works, ton	10.00—	
300-mesh, bags, c. l., works, ton	13.50—	14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00—	35.00
Chlorine, liquid		
Tanks, single units, works, freight equaled, cwt	3.15—	
Glycerine, refined (CP, USP) 99%, drums, c. l., lb	.29½—	
Litharge, commercial powdered		
Barrels, c. l., works, freight equaled, lb.	.18	—
Rosin, gum, c. l., f.o.b. New York, cwt		
E	9.30—	
F	9.30—	
G	9.30—	
WW	9.80—	
Rosin, wood, c. l., f.o.b., shipping point, cwt.		
K, M	8.25—	
N	8.30—	
WG	8.35—	
WW	8.50—	
Saltcake, domestic, bulk Works, 100% Na_2SO_4, ton	28.00—	
Soda Ash		
Dense, 58%, paper bags, c. l. works, cwt	1.80—	
Light, 58%, paper bags, c. l. works, cwt	1.75—	
Soda, caustic		
Flake, 76%, drums, c. l. works, cwt.	4.50—	
Solid, 76%, drums, c. l. works, cwt.	4.10—	
Sodium Silicate		
40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.45—	
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.45—	
Starch		
Pearl, 140-lb. bags, cwt.		
Pearl, barrels, cwt.		
Paper (Sq.), bags, cwt.		
Powdered, barrels, cwt.		
Sulfur, crude		
Bulk, c. l. mine, long ton	26.50—	
Talc		
Domestic, bags, c. l. works, ton	33.00—	39.50
Canadian, ground, bags, c. l. works, ton	20.00—	35.00
Titanium Dioxide		
Pigment, calcium-rutile base, regular, bags, c. l., lb.	.09¼—	
High-tinting, drums, c. l., lb.	.09	—
Zinc Oxide Pigment, American process		
Lead-free, bags, c. l., lb.	.14½—	
Leaded, 35%, bags, c. l., lb.	.15½—	

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	150.00—	
Bleached sulfite, Canadian	150.00—	
Unbleached sulfite	130.00—	
Unbleached sulfite, Canadian	130.00—	
Bleached soda	145.00—	
Bleached soda, Canadian	145.00—	
Kraft, bleached hardwood	150.00—	
Kraft, bleached	152.00—	155.00
Kraft, bleached southern	155.00—	
Kraft, bleached Canadian	155.00—	
Kraft, unbleached southern	117.50—	122.50
Kraft, unbleached, Far West	125.00—	
Kraft, unbleached Canadian eastern	130.00—	
Kraft, unbleached Canadian western	120.00—	125.00
Kraft, semi-bleached southern	140.00—	
Sulfite screenings	72.50—	
Sulfate screenings	67.50—	
Groundwood, domestic	—	

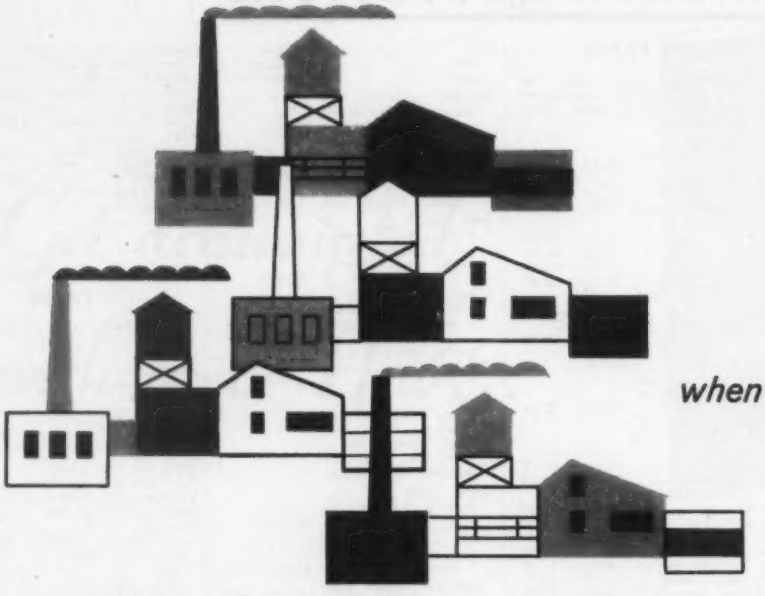
Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	150.00—	
Bleached sulfite, Norwegian	145.00—	
Bleached sulfite, Norwegian, del'd with limited freight allowance	145.00—	
Bleached sulfite, Finish, freight allowed	150.00—	
Unbleached sulfite, Swedish, freight allowed	130.00—	
Unbleached sulfite, Finnish, freight allowed	130.00—	
Kraft, unbleached, Swedish, freight allowed	125.00—	
Kraft, unbleached, Finnish, freight allowed	125.00—	
Kraft, bleached, Swedish, on dock	155.00—	
Kraft, bleached, Norwegian	155.00—	

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	19.80
No. 2 enamels	18.80
Machine-coated, 45- to 100-lb.	14.75— 18.40
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	16.55
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	15.65
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	63.20
75% "	48.45
50% "	36.95
25% "	31.00
Rag Content Ledger (white, 5000 to 100,000-lb., ream sealed cartons):	
100% rag	64.40
75% "	49.60
50% "	38.10
25% "	32.20
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	21.85
No. 2	21.15
No. 4	19.75
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.10
No. 2	22.35
No. 4	20.95
Newsprint (contract base price)	per ton
Rolls, standard	131.00
Rolls, spot	185.00—220.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.00
Butchers, counter rolls	10.00
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	



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A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

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PAPER INDUSTRY

Whither?

. . . in production, processes, new products, markets

Aerial application of fertilizer to forest areas

Experiments in aerial application of fertilizer to forest areas, carried out by the Rutgers University Forestry Department in cooperation with the Nitrogen Div. of Allied Chemical & Dye Corp., show 40-65 per cent growth increases. These experiments may lead to a practice (already in use in Europe) that could result in a cheaper and more abundant supply of pulpwood in both the northern and southern areas of the U. S. A.

Production of paper and board

Paper and board output during the first six months of 1956 reached 16.1 million tons, a 9.2 per cent increase over the corresponding period in 1955. Total production for 1956 is expected to be 31.5 million tons, a 5 per cent increase over the 1955 output.

U. S. newsprint production increased by 100,000 tons, or 14 per cent, over that of the first six months in 1955; while imports from Canada rose to a total of 2,580,000 tons, an increase of 130,000 tons.

New products from lignin

A number of pharmacologically-active products derived from vanillin, the most important degradation product of lignin, are reported by Dr. Karl Kratzl of the University of Vienna.

One of these products is vanillic acid diethylamide, which is 15 times as active as "nicethamide" in its effect on respiration and blood pressure. The compound has been applied successfully in several European countries in cases of acute circulation failure, barbiturate poisoning, and interruption of narcosis. Its effects were especially dramatic in general circulation failure of premature births.

Other products, in the alkaloid group, resulted from the introduction of the guaiacyl group of vanillin into the isoquinoline skeleton.

Extraction of lignin from finely ground wood

Milling small quantities of wood with a non-swelling liquid, such as a water-dioxane solution, in a vibrational ball mill has resulted in the extraction of 30-50 per cent of the lignin of Norwegian spruce, it is reported by Anders Bjorkman, Sweden.

New idea on waste liquor disposal

Dr. John Grebe, director of nuclear and fundamental research of Dow Chemical Co., has a relatively simple solution to the waste liquor disposal problem of the pulp and paper industry.

He suggests that the liquor be pumped into the ground to a depth of some 600-700 ft., using a 360 psi pump, at about one tenth of the cost, as estimated for one set of conditions, of conventional waste liquor recovery methods (see also page 592 in this issue).

Paper printed without the use of printing ink

A new paper has been developed by the Institute of Cellulose Chemistry, Darmstadt, Germany, which can be printed without the use of printing inks. The paper has a casing containing two layers of chemicals separated by a thin gelatinous film.

Under the pressure of the letters of the printing press, or typewriter, the gelatinous film is ruptured permitting the two layers of chemicals to react with each other and produce a visible color.

When used on the typewriter, there is no need for either the typewriter ribbon or carbon paper.

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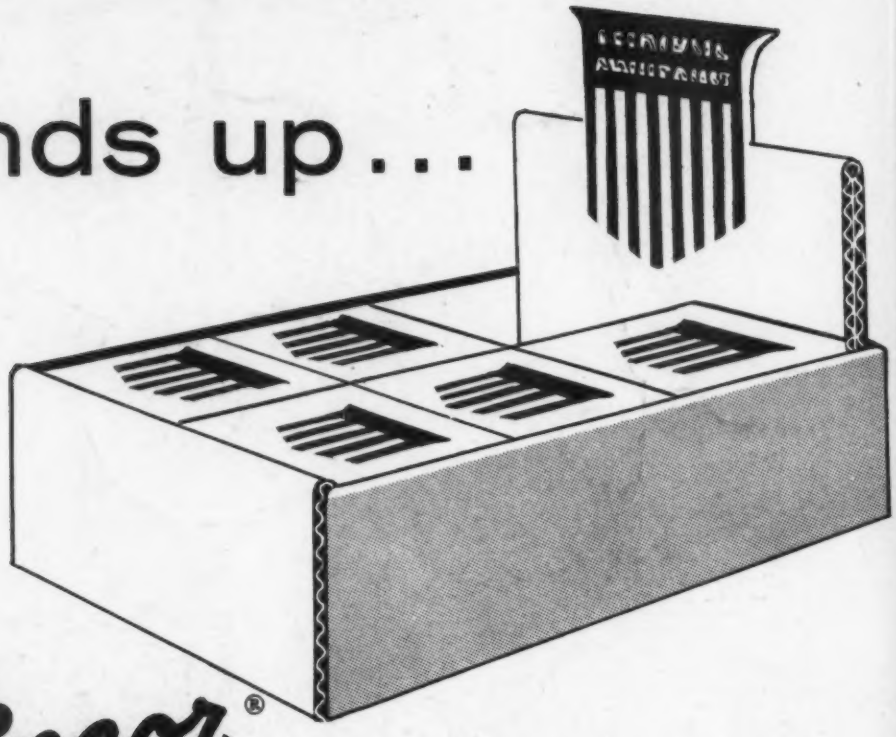

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